

Expressions and embeddings of deliberative democracy in mutual benefit digital goods

Serracino Inglott, Philip

Preprint / Preprint

Monographie / monograph

Empfohlene Zitierung / Suggested Citation:

Serracino Inglott, P. (2010). *Expressions and embeddings of deliberative democracy in mutual benefit digital goods*. Enschede. <https://nbn-resolving.org/urn:nbn:de:0168-ssoar-204797>

Nutzungsbedingungen:

Dieser Text wird unter einer CC BY Lizenz (Namensnennung) zur Verfügung gestellt. Nähere Auskünfte zu den CC-Lizenzen finden Sie hier: <https://creativecommons.org/licenses/by/4.0/deed.de>

Terms of use:

This document is made available under a CC BY Licence (Attribution). For more Information see: <https://creativecommons.org/licenses/by/4.0>

Expressions and Embeddings of Deliberative Democracy in Mutual Benefit Digital Goods

Philip Serracino Inglott

o Serracino Inglott

Expressions and Embeddings of Deliberative Democracy in Mutual Benefit Digital Goods

Philip Serracino Inglott

Master of Science Thesis
Philosophy of Science, Technology and Society
Faculty of Behavioural Sciences
University of Twente
The Netherlands

Track:	Philosophy of Technology
Student number:	s0207845
First Supervisor:	David R. Koepsell, J.D./Ph.D. Assistant Professor of Philosophy, Department of Philosophy, Delft University of Technology
Second Supervisor:	Johnny Hartz Søraker, Ph.D. Assistant Professor of Philosophy of Technology, Department of Philosophy, University of Twente
Presented:	28 October 2010

© 2010

Philip Serracino Inglott



This work is licensed under the Creative Commons Attribution-ShareAlike 3.0 Unported License. To view a copy of this licence, visit <http://creativecommons.org/licenses/by-sa/3.0/> or send a letter to Creative Commons, 171 Second Street, Suite 300, San Francisco, California 94105, USA.

Front cover artwork by the author.

Made with the GIMP and aa-lib free software using image material from

http://commons.wikimedia.org/wiki/File:Temple_hephaistion_Agora-Athens.jpg

by Ifernyen and ulrichstill under the [Creative Commons Attribution-Share Alike 3.0](http://creativecommons.org/licenses/by-sa/3.0/) license.

Abstract

Since democracy is so desirable and digital technologies are so flexible and widespread it is worth asking what sort of digital technologies can, through use, enhance democratic practice. This question is addressed in three stages. First, the notion of Mutual Benefit Digital Goods (MBDGs) is developed as a tool for discerning the digital goods that hold a potential for nurturing democratic virtues. MBDGs are those digital goods that allow a user to make such goods one's own and to put something of oneself into them. This can be achieved either directly, by working at creating a derivative of a digital good, or by engaging a community of production for digital goods. The second stage is the identification of a theory of democracy that is adequate for discussing democracy in relation to cyberspace. Deliberative democracy, particularly as presented by Dryzek, is put forward as the most appropriate conception of democracy to be used. This conception makes it possible to overcome the difficulties posed by the notions of citizens and borders as presented in other conceptions of democracy. In relation to cyberspace, such notions are particularly problematic. In the last stage, MBDGs and deliberative democracy are brought together by means of the theory of technological mediation and Feenberg's theory of technological subversion. The theory of mediation holds that the use of technologies modulates our moral landscape. Because of mediation, subversion of digital technologies is always self-expressive to some extent. Therefore it exhibits the same grounding characteristics as deliberative democracy: mutual respect, reciprocity, provisionality and equality. Since MBDGs are most open to subversion, they are also the digital technologies with the most potential for fostering democracy. This claim is corroborated by looking at iconic MBDGs (Free/Libre/Open Source Software and Wikipedia) and revealing how the virtues necessary for deliberation are manifest in some of the activities surrounding these digital goods. The ideas presented, if accepted, have practical implications for institutions desirous of enhancing democratic practice. Such institutions ought to evaluate their choices on digital technologies also on grounds of democratic potential, reduce obstacles to alternative appropriation of digital goods through regulation, and foster MBDGs.

*To my uncle, Dun Lawrenz,
who showed me the correct handling of knives, books and wine
such that my tools, wit and taste may be kept sharp*

Acknowledgements

I would like to express my sincere gratitude to my first supervisor, David Koepsell, from TU Delft, who kindly took me under his supervision. He put up gracefully with my occasional quirkiness and gave me great latitude in my work, all the while masterfully nudging me in the right direction. His keen analytic eye has been an indispensable asset. I am also particularly indebted to my second supervisor, Johnny Søraker, who has not only been an illuminating guide throughout but also a source of personal inspiration and a supportive friend. Additionally, I would like to thank Steven Dorrestijn and Dirk Haen who helped me by providing precious feedback and insight about my work.

I wish to thank all the staff at the department of philosophy, an incredible team, led by Philip Brey. It has been a pleasure working with you. The director of the Philosophy of Science, Technology, and Society programme, Peter-Paul Verbeek, deserves particular mention for his energetic drive and personal attention to students. Thank you for making it possible for me to study philosophy of technology.

I am especially grateful to my parents, and my aunt Helen, without whom I would not be anything at all, as well as my brother and his family. I also owe heartfelt thanks to my two priest uncles, Lawrence Cachia, who seeded the hacker spirit in me, and Peter Serracino Inglott, who put me on the path of philosophy.

During my stay at Twente I have had the honour of being chairperson of Ideefiks, the student association. My fellow board members have made it a most memorable experience. I learnt so much due to Ideefiks, thank you all. Gijs was particularly helpful, going as far as dragging me to the library. As were The High Daggers, Vincent, Jasper, Dominic, Wessel, Jochem and Pim. Hanging out with the ‘band of philosophers’ provided me with ample space where, to put it mildly, I could think out of the box about my topic. The crowd at Witbreuksweg, 399, including those who did not actually live there, are too many to mention individually. The chaos which this second family surrounded me with was sometimes distracting, but mostly it provided me with the warm glow of friendship and happiness, especially when my mood was dim. Without all these people I could have never written this thesis.

The past few month’s work on this thesis has been the culmination of an extraordinary two years spent mostly on the University of Twente campus. During this time I have crossed paths with a large number of wonderful people all of whom have somehow shaped me, and in so doing shaped this work. Even if they are too many to name one by one, this work has within it a little something of all those I have been influenced by on so many different levels.

Lastly, the debt of gratitude I owe to my wife, Victoria, for my being where I am today, is of such magnitude and extent that any attempt at putting it down in words here would not do it justice. I simply strive on in the blind hope that I shall be able to reciprocate several times over.

Philip Serracino Inglott
Luxembourg, October 2010

Table of Contents

Abstract.....	3
Acknowledgements.....	5
Introduction.....	7
Mutual Benefit Digital Goods: A Normative Definition.....	13
Digital Objects → (Things) → Goods	15
Mutual Benefit.....	17
Conviviality of Tooled Things.....	19
Appropriation of Mutual Benefit Digital Goods.....	22
Posterity and Common Heritage.....	25
Limits to Mutual Benefit	27
Some Examples of Mutual Benefit Digital Goods	29
Conclusion.....	32
Democracy for/in Cyberspace.....	34
The Deliberative Poll.....	36
Deliberative Rationality.....	38
The Relevance of Deliberative Democracy to Cyberspace.....	42
Difficulties of Transposition.....	45
On the Discursive Nature of Cyberspace.....	49
Conclusion.....	50
Technology Democratising its Users.....	51
Interaction of Technology and Morals	54
ICT and Democratic Values.....	60
Conclusion.....	69
Deliberative Features of the Use and Production of Mutual Benefit Digital Goods.....	71
Wikipedia.....	72
FLOSS.....	78
Open Access Academic Journals.....	85
Public Data and Folksonomies	87
Conclusion.....	88
Conclusion.....	89
Bibliography & References.....	95

Introduction

The spirit of democracy is not a mechanical thing to be adjusted by abolition of forms. It requires change of the heart.

Mohandas Gandhi (2004, p. 258)

Gandhi was writing at a time before computers, and the forms he is referring to are the social system of castes in India. It would therefore be most intriguing to speculate what his reaction would be if it what suggested to him that to improve democracy what is needed is the application of mechanical things to the shape of democracy. This is what is being attempted in various developed nations today to try and make them more democratic. The application of Information and Communications Technology (ICT) to improve the effectiveness of the current forms of democracy is known as eDemocracy. ICT is applied like an instrument, digitally rather than mechanically, to make the current democratic processes more efficient. To date, the results of such efforts have not been terribly encouraging (Macaluso, 2007). Could it be, perhaps, that ICT, this technology with apparently limitless adaptability and power, can help address the issue the European Union calls ‘democratic deficit’¹ by bringing about a change of heart in people?

Another Indian, Sugata Mitra, an intellectual of our times, set up computers connected to the Internet in poor neighbourhoods such that they were accessible to the most underprivileged children in India. He wanted to see if these kids could teach themselves how to use a computer. Not only did the kids learn to use the computer, but the adults around them noticed that their behaviour started to change too. Initial research attempting to measure the values of children using these computers seems to confirm that the children’s values shift in interesting ways (Dangwal & Kapur, 2009a). On the other side of the world, Benkler & Nissenbaum (2006, p. 419) “have argued that participation in commons-based peer production fosters important moral and political virtues.”

If the change of heart occurs when children self-learn at a computer, and it is production, not consumption, that fosters political virtue, perhaps the instrumental application of ICT to the problems of democracy, as is prevalent in many eDemocracy projects, is the wrong approach. If it is the way in which ICT is *used* that might help address the democratic deficit then it is pertinent to raise the question: **what particular kinds of ICTs can, through use, nurture the virtue of civic duty (the capacity for democratic life) for its users?** This question is the subject of this study. This question immediately raises two more questions that need to be addressed beforehand: 1) How can one discern amongst the multitude of differing ICTs available in a way that helps address the main question? and 2) What conception of democracy is to be used?

ICT is a very generic term. For the purposes of this work only digital technologies prevalent on the Internet are considered. To be able to answer the main question I shall propose a categorisation of digital entities that facilitates the identification of those ones which possess democratic potential. This categorisation is addressed in the first chapter.

Because the notion of democracy comes under so many different conceptions, addressing the main question also requires a concept of democracy which enables us to have a better

1 Democratic deficit is when ostensibly democratic organizations or institutions are seen to be falling short of fulfilling the principles of democracy in their practices or operation, with the consequence that the virtue of political participation loses its value for the people.

See http://europa.eu/scadplus/glossary/democratic_deficit_en.htm for a formal definition (Retrieved 11th Oct. 2010).

understanding of its problems in the context of an ICT mediated populace (aka ‘the information society’²). This is the subject of the second chapter.

Using the concepts explored in the first two chapters, the third chapter proposes a mechanism that explains how ICT, through use, can promote the virtue of civic duty in its users. The fourth chapter explores some ICTs (isolated on the basis of the categorisation proposed in the first chapter) for their democratic potential (in terms of democracy as presented in the second chapter). I conclude by discussing some of the practical implications of my observations.

How can one discern kinds of ICTs that foster civic virtue?

Given the very large variety of digital entities with which we are confronted in our daily lives, where does one start to look for democratic potential? The serendipity of a shared discourse and the interconnectedness of the Web help uncover a pattern. Benkler and Nissenbaum (2006) have pointed out how what they call “Commons-based Peer Production” of digital goods embodies virtues. The technologies they name are Open Source Software, Wikipedia, SETI@home and Blogs. It would seem that the online technologies that are ‘open’ or depend on some sort of crowdsourcing³ share something at the moral level. Moreover this word ‘open’ is used very freely in such terms as Open Access publishing, Open Educational Resources, Open Standards, etc. There seems to be a whole class of digital goods that exhibit some sort of commonality that is not merely in their method of production. What does Wikipedia share in common with Linux, besides the facts that both are free and are produced by a voluntary community? Moreover, an article, even if published as Open Access, or on a popular blog, is not community produced. Several important Open Source Software tools are not community produced, even if by being Open Source they could be. It would seem that the commonality that brings all these digital things together, and provides for a *prima facie* impression of online freedom, lies beyond the specific technicalities of their production. It would seem that several goods found online sharing a discourse of openness have characteristics that make them readily available and exploitable by the community, both for the benefit of individuals and of the community itself.

In the beginning of the first chapter I shall explain what makes a digital object be a digital good. A digital good is any digital object that is valuable within some specific context or other. It is important to keep in mind that digital objects are ontologically dependant on the technologies which express them. Thus evaluating a digital good for its potential virtues also depends on the relevant context, which includes their supporting digital technologies. Within specific contexts, or communities, certain digital goods make themselves more readily available for exploitation for the benefit of all.

Using Peter Kropotkin’s (1902) notion of Mutual Aid as an analogy, I call the class of digital goods that posses this beneficial potential Mutual Benefit Digital Goods (MBDGs). It is these

2 There is no universally accepted definition of ‘information society’. I use the term loosely to mean a society that is (or is actively striving to become) one where the creation, manipulation, distribution and exploitation of information, mainly through the use of ICTs, is a crucial aspect of life and identity of, and within, that society. By ‘a crucial aspect’ I mean that information related activity is an integral part of all other forms of activity, be they economic, cultural, political or health related activities.

3 “[C]rowdsourcing represents the act of a company or institution taking a function once performed by employees and outsourcing it to an undefined (and generally large) network of people in the form of an open call. This can take the form of peer-production (when the job is performed collaboratively), but is also often undertaken by sole individuals. The crucial prerequisite is the use of the open call format and the large network of potential labourers.” (Howe, 2006)

goods that will be explored for their potential to nurture democratic virtues. What makes a digital good prone to exploitation for common benefit also depends on the tools which allow its meaningful comprehension i.e. the software on which it runs. Building on Carl Mitcham's (2009) idea of Open Source software as a convivial tool, I explore how Ivan Illich's (2001) concept of conviviality is applicable to digital things, software and goods. Convivial tools are technologies that allow a person to flourish within one's own context, rather than inhibit self development. What this means for non-rivalrous goods such as digital goods is that they are appropriable. The user of an MBDG can make that good one's own and manipulate it, using convivial tools, to yield a new instantiation of the original good derived from the original, but new in that it expresses something of the user/copier/producer him/herself. It is appropriability that distinguishes MBDGs from other digital goods.

This is the common feature that digital phenomena which stand out as having something of a democratic character share: they are, to a greater or lesser extent, appropriable. When a user can, through the use of convivial tools, adapt the meaning of some fashionable Web 2.0⁴ service to their own context; when a user can add to, and improve, or even remove features from, decrease the power of, a digital good; when a digital technology permits a community to give alternative meanings to it, and to the goods it yields; that good is appropriable. Digital goods can be also indirectly appropriated by engaging their community of production.

Another characteristic that MBDGs share is their propensity towards posterity. What this means is that because they are digital and therefore light on the resources required to keep a record of their evolution, MBDGs are easy to archive. Not only is it easy to record the history of their development as it happens, it is also feasible to keep intact and preserve every single iteration of development. Because they are appropriable by anyone, such a record of their development is also very easily kept as a public record.

It is possible to conceive an MBDG which has significant practical value at present but has little value for posterity. Yet the public historical record, the trail of digital debris that is open to review, of the emergence of that digital good, along with its acquisition of meaning, is of value to posterity. By exposing the reasoning that brings our technology to mean what it does it is possible to avoid limiting the possibilities for future interpretations by future generations. A digital good is an MBDG when it also has a history of appropriations, such that it is clear that it shall not restrict the possibilities of appropriation in the future.

No MBDG available online can match this characterisation perfectly, and there are several ways in which the appropriability of a digital good can be limited. But this definition can serve as a basis for identifying, limiting the scope of, and then exploring some digital phenomena for their democratic potential.

What conception of democracy is to be used for understanding the relationships between democracy and cyberspace?

Democracy is most often spoken of in the context of nation states. Cyberspace is made up of informational exchanges and exists through communications technologies such as the Internet. Cyberspace is a space only in a metaphorical sense—a domain or a realm of life, not a geophysical space. A theory of democracy that is not based upon some natural state of the

4 Web 2.0 is a buzzword with no agreed meaning but generally used to refer to newer, more interactive and dynamic uses of Internet technology. It normally indicates some form of user generated content. Examples of Web 2.0 include social-networking sites, blogs, wikis, video-sharing sites, hosted services, web applications, mashups and folksonomies.

world, but builds upon some conception of inter-subjective communication would have more explanatory power in this context. One such theory is that of deliberative democracy.

In the second chapter I shall first provide a short overview of the basic ideas behind deliberative democracy. In the fashion of reverse engineering, I start from practical examples of deliberative practices (as presented in Fishkin, Luskin, & Jowell, 2000) and abstract away to the core principles that ground that practice. Next I attempt to transpose the concept of deliberative democracy to cyberspace. Three major conceptual stumbling blocks are readily identifiable: the idea of citizen (who is a citizen in cyberspace?); that of borders (can one talk of democracy without reference to geographical space?); and that of the establishment (who shall carry out the democratic will, if not a national government?). Each of these issues is examined in turn.

In view of these issues I identify John S. Dryzek's (1994, 2002, 2005) version of deliberative democratic theory as flexible enough to be adaptable to non-nation state contexts. Dryzek's theory is firmly grounded in discursive rationality (which is related to Habermas' Communicative Act Theory). Since cyberspace exists through communications technology, every action within it is also performed through communication, therefore, a theory of deliberative democracy that builds on discursive rationality, and is flexible with regards to its context of applicability, is the most adequate conception of democracy for the task at hand.

How does ICT, through use, promote the virtue of civic duty in its users?

Having limited the scope and clarified the two main concepts of the original question (what kind of ICTs can, through use, nurture the virtue of civic duty in its users?) it can be made more specific as follows: **Which Internet technologies and digital goods are such that, through use, they nurture the virtues required for deliberation (and therefore deliberative democracy) in their users?** And the tentative answer would be: **Mutual Benefit Digital Goods**. It is obvious that to justify such an answer one needs to also answer the question *how* do MBDGs nurture the virtues required for deliberation? In the third chapter I will elaborate on a mechanism that can answer that question.

The mechanism I present depends on the co-constitution of humans and their morality with technology. I start by revisiting the ideas of Langdon Winner (1986) which show that technology is not politically neutral. Unless we abandon the idea that technology is morally neutral (i.e. that it is simply a tool), unless we consider unintended effects and the expressive impact of technologies, it will be impossible to show that technology can play a role in modulating individuals' and communities' normativity. Next I briefly sketch Bruno Latour's (1994, 1996, 1999) Actor Network Theory, which explains the social construction of technologies through the modulation of meanings. Technologies are networks of both things and humans. The way we understand the world, including how we understand technologies and ourselves, depends on the interactions of such networks. As our understanding changes so do the networks, and vice-versa. What a technology is depends on the network's interactions, and the way we understand the world depends on the technologies which surround us. Latour's ideas help overcome the human-artifact distinction in terms of morality.

Having shown that morality and technology do interact, I introduce Verbeek's (2005) idea of the mediation of human action by technology to explain better how the use of a technology plays a role in self-understanding and in our conception of the world. With such an understanding of technology, ethical evaluations of technology can be made on the basis of

the constitution of the subject. A virtue ethics of technology, possibly based on Foucault's work, as opposed to an ethics of rights and obligations or of consequences, suggests itself as more useful.

Having thus established how technologies can modulate morality, understood as constitution of the self, I move forward to suggest how digital technologies can modulate one's morality towards deliberative principles. To do this I invoke Andrew Feenberg's (1992, 1999) theory of the subversion of technology. Feenberg's theory argues that, because of the 'play in the system' of any complex technology, users always have the opportunity of appropriating that technology and giving it alternate meaning and use. Since digital technology is so flexible, the opportunities for subversion are quantitatively expanded to a point where there is a qualitative difference in the effects of subversion. Feenberg presents subversion as a means of democratisation of technology, because it empowers the people against the elite. But when subversion takes on digital technology there is a deeper level at which it converges with deliberative democracy.

Digital subversion, the re-appropriation with differing meaning of the technologies which manipulate information, shares the most basic ideas with a discursive notion of democracy: both affect the world through expression of ideas; discursivity demands equality of power among deliberators, while digital technology provides all actors with the same tool-kit by encoding all symbols using the same basic constructs; and subversion involves a constant opposition to the *status quo*, which reflects the principle of provisionality in deliberative democracy.

Of course there are substantial pragmatic limitations to the vision of digital technologies yielding an ideal discursive space for democracy to flourish. For example current intellectual property laws severely limit the possibilities of subversion of digital technologies. The category of MBDGs provides an abstract metric for identifying those technologies which have a potential for subversion (through appropriation) that is substantially greater than that of other digital goods, thus an increased propensity for a balanced power distribution and for discursive action.

To support the claims made thus far, the fourth chapter is dedicated to exposing some MBDGs for characteristics of deliberative democratic practice. This provides but a coarse inkling of what an extensive empirical investigation of these technologies might reveal. The focus is placed on the most easily identifiable MBDGs: Wikipedia and Free or Open Source software. Open Access publishing and other Web 2.0 technologies shall be only very briefly touched upon. This analysis tries to cover both the production and the use of MBDGs. In the conclusion I shall suggest what are the practical implications of the claim that **under a conception of democracy that makes sense for the information society—deliberative democracy—MBDGs are the ICTs most capable of nurturing civic virtue in their users**. I also include some suggestions for further research, in view of the limitations of this study.

The ultimate consequence of this analysis should not be a surprise to anyone. Essentially the best suggestion that can be extracted is that governments investing in ICT ought to also evaluate their choices on ethical criteria. In making such an ethical evaluation, the democratic (or anti-democratic) potential of a technology should also be considered. This should be a simple idea that is easy to accept. It is hoped that this work will be able to provide a useful vocabulary that can be adapted and used by those who engage in such evaluations.

— 1 —

Mutual Benefit Digital Goods: A Normative Definition

The objects of this enquiry are digital things. In this chapter I will develop a categorisation for differentiating digital things so as to identify those which have an increased potential for promoting democratic values through use. First I shall discuss the nature of digital goods and the importance of context to their value. The digital goods which, within specific relevant contexts, make themselves more readily available for exploitation for the benefit of all are the category which, as I shall argue later, have an increased potential for democratic value. Using the notion of Mutual Aid in evolution as an analogy, I call this class of digital goods Mutual Benefit Digital Goods (MBDGs). Exploitation of digital goods for common benefit also depends on the tools which allow their meaningful comprehension, so next I explore how Ivan Illich's concept of conviviality is applicable to digital things, software and goods. On the basis of this I conclude that MBDGs are those digital goods which are to a greater or lesser extent appropriable. By appropriation of a digital good I mean the ability of a user to make that good one's own—to give it an alternate meaning. I shall then explain how appropriation takes place. Next I discuss some limitations which inhibit appropriation of digital goods, and why it is that not all digital goods are MBDGs. Finally I give a brief overview of some exemplary and potential MBDGs.

Digital is a notion under which the perceptible is represented as a continuous stream of discrete instances of a binary code: true/false, on/off, 1/0. Through a series of mechanical operations (algorithms) the digital stream can be presented as, or it can encode, meaningful entities. These entities can be bounded in space and time, just like other non-digital perceptible entities. Therefore parts of the digital stream can be properly considered things. In the same way that one can discern where a physical picture ends, and can distinguish it from the wall it hangs on as a distinct object, so can a digital photo be conceived of as an object unto itself, separate from the screen it is displayed on, or the electrons pulsating in the screen without which there would be no picture.

An eBook is like money in my bank account, while a paperback is more like cash in my wallet. The copy of F. Scott Fitzgerald's "The Great Gatsby" lying on my desk is a token. If I ask you to hand me that book I am referring to the thing itself. But if I ask if you have read the book I am referring to the type. On the other hand the eBook of "The Great Gatsby" is both a token and a type⁵. If I ask you to pass on to me that eBook what you would send me, by email for example, is not the token, not the actual electrons in the computer's memory representing the eBook, but a duplicate of the eBook. In the case of digital things the token is constituted by a specific state of a machine such as a computer. These digital things have some peculiar characteristics which can be morally and politically significant. Such characteristics as their ontological dependence on perfect replication, or the possibility of the same meaningful token to be represented by various binary streams, inscribe an inherent political potential that warrants special attention.

Attending to the political implications of the presence of digital objects requires an adequate vocabulary. The purpose of this inquiry is merely to identify one category of morally valenced digital objects. The purpose of this identification is to be able to call by name a motley of digital objects which might have little in common on the perceptible level, but share a latent morality.

5 A digital token is merely the state of the bits in a computer's memory or hard drive. Each copy of the PDF on several computers is a separate token of the same particular eBook. Therefore this specific eBook is also type.

Digital Objects → (Things) → Goods

Not all digital objects are created equal. Not all are created in the same manner either. Any sequence of bits that can be isolated and interpreted meaningfully is an object (i.e. all that is digital, demarcated, and not noise). Digital objects become interesting within a much wider context when they are complex and substantial enough to be spoken of as things independent of the technology that sustains them. Several digital objects are things like pointers, arrays, functions, checksums, byte streams, etc. therefore pretty uninteresting, except in the context of hardware architecture and software design. While digital photos or eBooks necessarily depend on supporting technology to exist at all, it is still meaningful to speak of them as independent entities, even in non-ICT contexts. This distinction is primarily aimed at readers with a background in software programming. If a digital object is that sequence of bytes allocated in a computer's RAM when a C++ function call instantiates a class, then by a digital thing I mean that which would in lay terms be understood as a 'thing' and happens to be digitally embodied in that chunk of RAM. The two are ontologically linked, if not one and the same (the lay terms thing might be made up of several C++ objects, and needs functioning hardware to be perceivable) but when the digital sequence is understood as a thing, rather than as an object, its political and ethical relevance is more discernible.

The digital things which are relevant to this inquiry are those that carry value. The digital objects that can be meaningfully spoken of as things independent of their supporting technology and can be given a value (not necessarily monetary) are what I shall refer to as digital goods. Of course any digital thing can be given some value; the efficiency demands of digital systems, and the ideology under-girding their design, imply that nothing is surreptitious in a digital system. My emphasis, therefore, is on digital things *as goods* in the context of people's daily lives. Consider the humble mouse pointer. What value can that have? To start off, it is valuable as an indicator of what I am doing on my PC. If I can change it so it is larger and provides higher contrast, that particular pointer would accrue greater value to a person with limited sight. If on the other hand I change the pointer to a peace symbol, it obtains value as an indicator of my tastes or ideologies. In a software development context this mouse pointer can also be evaluated for how many CPU cycles it needs to be displayed, how much memory it occupies, or how expensive it is to develop. The term digital good denotes that attention is here being directed at the former class of value attributable to digital objects, rather than the latter set.

Thus, digital goods include such things as audio tracks, word processing files, computer games or software packages as well as records of conversations and dialogues such as mailing list threads or blog posts (with associated comments). Digital things which are generally not goods are such things as File Allocation Tables, individual packets of TCP/IP data, file headers, mark-up elements, etc. These are not goods only in a general sense, for in the context of software engineering or computer science they do in fact have significant value.

The delineation of what are to be considered digital goods depends on context, or the audience/receptor for that good. This raises the question of what context is relevant here. So, before proceeding, it is important to clarify the nature of this context.

The Mythical Mom and Humanity vs. Community

There are two simple contexts that can inform the discrimination of digital goods from mere digital things. One is the 'individual' and the other is 'humanity'. Both are extremes, which simple as they are to conceive, cause more confusion than clarity.

What makes a digital thing valuable to an individual depends entirely on that individual. While one could try to zero in on some common denominator, a set of attributes which when present in any digital thing would make it valuable to any individual, it is doubtful what would be left other than some vague circular definition. While this problem is rather obvious, most discourse surrounding ICT talks of the 'user' as some clearly defined and determinable entity. Whether it is Bill Gates or Linus Torvalds, Nicholas Negroponte or your local tech support geek, they all seem to have a similar conception of the user as some collective entity that captures the notion of individuals.

The characteristics of this 'user' vary according to the speaker and the audience, but they typically tend towards a characterization of my mother, at least from a technical standpoint. The mythical average user is competent enough to make use of a PC but not quite so technical enough to understand what is going on. This user is impatient, not up to date, and has some specific task to carry out with their computer. But my mother is also a poet. She likes cats, and misses me now that I live far away. The 'user' never captures the notion of person except in terms of time and money.

The other extreme context for evaluating the value of a digital good is the opposite of the mythical mom context. Taking all of humanity as your context for evaluating the value of a digital good is no more adequate than the mythical mom context, for equivalent but opposite reasons. A digital thing that has value for all of humanity is indeed possible (even if, probably, only in theory) but would need to be so generic, so universally recognisable, so neutral, that any value it could provide would be so small to be almost none at all. A categorisation based on such a wide context would exclude too much as well.

One could try and find some balance point between these two extremes, but any point on that continuum would still suffer from the problems of both contexts. An alternative approach is to use a different scale. The notion to be used here is that of 'relevant communities', which is borrowed from field of Science and Technology Studies (STS) (Sismondo, 2009). When the Actor Network Theory of Latour is criticized because there is no way to pre-determine which are the 'relevant actants' the response is one of pragmatism. Using a mix of tacit knowledge, experience, common sense, and practical judgement, the relevant community relating to a digital thing becomes a shifting window adaptable to the current frame of discourse (Latour, 1999). Thus, generally speaking, a digital photo is to be considered a digital good if it is of value to digital photographers. A photo taken when the shutter is triggered accidentally while the lens cap is still on is not a good, even if it is still a thing. On the other hand the very same image might be a good to a quality assurance engineer who is trying to determine how the CCD⁶ in the camera deteriorates with time.

What is meant by a digital good is not based on a sharply specified set of criteria but a more fluid discursive judgement as to what is relevant. This follows in the spirit of scholars from Habermas to Foucault, or Feenberg to Illich who want to eschew an exclusively instrumentalist/utilitarian/efficiency-based evaluation of the world in favour of what could be called a more sensual conception based on alternative rationalities.

6 A Charged-Coupled Device, or CCD is an electronic component which captures the image in digital cameras

Technologies and Their Ontological Dependents

Digital objects are unlike ideas as they do not merely exist as some form of human inter-subjectivity. Yet, a single digital thing is not an artifact that occupies a contiguous chunk of space, with a fixed mass, it cannot be grabbed with bare hands. Its existence depends on specific functions of digital technologies. Digital things can have meaningful tokens independently of this or that specific technology, but always depend ontologically on devices which can express that particular stream of bits as a meaningful thing. Digital things are not as easily tangible as other artifacts. What, and where, is a specific digital thing, therefore, will always be a very difficult question to answer in an objective way.

Even if one interprets Latour's ideas as implying some sort of agency for technology itself, the digital things expressed by the technology do not have any agency of their own. To solve this impasse we have to stop thinking of digital things as existing *within* a technology. Instead we should consider technologies as mediating human action and interaction, as described by Verbeek (2005). Now it is possible to conceive digital things as existing through a technologically mediated inter-subjectivity. In other words, digital things depend ontologically on human → technology and technology → human relationships.⁷

Such a conception makes it possible to substitute statements about the politics, value or morality of a digital good for equivalent statements about the political consequences, value brought about or moral implications of the technological+human arrangement which ontologically grounds that digital good. Only specific technological+human arrangements make the existence of certain digital objects possible, and the presence of certain digital objects implies a particular technological+human arrangement. With this understanding of what digital goods are, one can apply theories of politics and technology to digital things in a useful and relevant way.

I have identified digital goods as digital sequences that are meaningfully bounded (objects), their meaning is independent of the technology upon which they depend for existence (things) and are of value to the relevant community. Next I will explore some shared characteristics which are present in a diversity of such goods, and explain why such goods are more politically interesting than other digital goods which lack such characteristics. I will try to zoom in on a group of digital technologies (from among those which yield digital goods) which have a positive, or desirable, political valance.

Mutual Benefit

In 1902 Peter Kropotkin published Mutual Aid: A Factor of Evolution in which he proposed an alternative interpretation of Darwin's theories with regards to social behaviour. Kropotkin was responding to the then popular streams of social Darwinism and countering the "survival of the fittest" mantra that guided much social theory. While travelling in Eastern Siberia and Northern Manchuria he observed that under such harsh conditions the strategy that made for the best chances of survival was not individualistic/egoistic competition for resources but an aptitude for mutual aid. He observed that the animals that thrived better were those individuals of the same group which helped one another, even making self-sacrifice for the benefit of the group. He extended his observations to native communities and observed the

⁷ The → alludes to phenomenological intentionality, i.e. a sort of directedness or aboutness.

same principles of mutual benefit operating at the social level in these communities. Kropotkin's theory is tightly linked to his anarchist communism ideology.

As a scientific theory of evolution Kropotkin's theory has been largely discredited, but other similar studies have validated his basic idea to some degree. Also, the Open Source community has been described in related anthropological terms such as those of the gift economy and kinship amity (Bergquist & Ljungberg, 2001; Zeitlyn, 2003). So I think that the story of 'mutual benefit' can serve as an enlightening allegory for categorising digital goods.

Let us imagine for a moment that the world was in fact as Kropotkin describes it. That survival of the species did depend more on each individual's ability to provide mutual benefit to the group. Research in evolutionary psychology suggests not only that such a hypothesis is plausible, but that it fits particularly well with the human species. In a much less poetic language than Kropotkin's, evolutionary psychologists can account better for many observed behaviours on the basis of 'reciprocal altruism' than by any naïve interpretation of Darwinism as mindless selfishness (Axelrod & Hamilton, 1981; Ben-Ner & Putterman, 2000; Gintis, Bowles, Boyd, & Fehr, 2003; Henrich, 2004; McAndrew, 2002; Trivers, 1971). This hypothesis would conversely imply that survival required that the group was capable of extracting benefit from whatever single individuals made available. Now let us substitute the 'species' with 'information society', and the scarce resources with digital goods. Unlike grazing grounds in northern Manchuria, digital goods are not intrinsically scarce (being digital they can be infinitely reproduced at almost no cost) but they can be made scarce through technical and legal means as well as through social norms or the market (Lessig, 2005). With this allegory in hand we can ask the question "what kind of resource best safeguards the survival of the species?" The question can be re-phrased as "what kind of resource can the group best draw benefit from?" Translated to the context of cyberspace we can ask "what kind of digital good best contributes to the survival of the information society?" The 'survival' of the information society is ill defined, after all it is not a species. To answer that question, what needs to be identified are digital goods that, due to technologies' ability to modulate the moral landscape, contribute to the flourishing of the netizens.⁸

While all digital goods are valuable to the relevant community, not all of these can be exploited for the benefit of the individual. Other digital goods can benefit individuals but not communities as a whole, or they might simply not be readily available within the community. Thus the sub-class of digital goods, which holding on to the allegory above, I refer to as Mutual Benefit Digital Goods (MBDGs), are those digital goods which have characteristics that make them readily available and exploitable by the community, both for the benefit of individuals and of the community itself.

For the concept of MBDGs to be useful three potential sources of ambiguity need to be cleared. First, digital goods, by virtue of being digital, ought to be intrinsically readily available to any online community. This is not the case, as digital goods exist in a world in which laws, markets and technology itself all modulate what individuals can actually do with digital goods. Second, while it is rather simple to conceive what exploitation of a resource

8 I use the term netizen and/or cybernaut almost interchangeably throughout this text. By netizen I mean a person who has a life on the Internet. A cybernaut is a person who has a life in the wider cyberspace. I leave 'having a life' intentionally vague because of the incredible variety this can take. A netizen is like a citizen in that a netizen 'belongs' to the Internet like a citizen 'belongs' to a state. The difference is that citizenship depends on fixed rules (law) and historical contingencies (e.g. place of birth), while netizenship is determined by the actions one performs through an inter-connected digital machine (typically the hours spent online at a PC)

such as food entails—it gets eaten, what exploitation of a digital good means requires specification. Lastly, claiming that MBDGs can be exploited by a *community itself* rather than all of its members imparts some sort of agency to the community *per se* which could be problematic. Addressing these pitfalls will crystallise the notion of MBDGs.

Conviviality of Tooled Things

Within an instrumentalist ideology, upon which contemporary liberal market conceptions of the world thrive, availability means availability on the market, and exploitability is a potential to yield market value. This ideology has been criticised for failing to capture human flourishing in a complete manner (by Habermas, Foucault, Feenberg and several others). Alternative evaluative frameworks are possible. Carl Mitcham (2009) has suggested Illich's notion of conviviality as an evaluative framework for software. He evaluates Open Source Software⁹ (OSS) in terms of conviviality to reveal values other than those of 'user-friendliness'. Can conviviality be used to evaluate more than just software, not just the digital tools, but digital goods?

Tools, for Illich, are more than the physical equipment which humans use to modify nature. Tools are technological means, used to achieve human ends. Bureaucratic administrative systems or educational programmes are tools, as are hammers, cars and power drills. As

9 Throughout the text I use Free/Libre/Open Source Software (FLOSS) as examples of MBDGs or as convivial software capable of expressing MBDGs. FLOSS is, generally speaking, software for which the source code, i.e. the human readable instructions which make up the program, is freely available under some form of licence that dispenses with some of the copyright holder's privileges. There are four fundamental rights (or freedoms) which FLOSS grants any user through licensing. These are:

- Freedom 0: The freedom to run the program for any purpose.
- Freedom 1: The freedom to study how the program works, and change it to make it do what you wish.
- Freedom 2: The freedom to redistribute copies so you can help your neighbour.
- Freedom 3: The freedom to improve the program, and release your improvements (and modified versions in general) to the public, so that the whole community benefits.

The availability of a program's source code is essential for these freedoms to be effective since the binary code is too impractical to be read or modified by humans.

Typical examples of FLOSS the reader might be familiar with include Linux, the Firefox web browser, and the VLC media player. Other FLOSS the reader probably uses without being aware are the Apache web server which is the most widely deployed web server software globally, the PHP language which drives Facebook, and drives Mediawiki, the software behind Wikipedia. Many large corporations have come to depend on FLOSS, from Google to animation studios in Hollywood.

The differences between 'Free Software' and 'Open Source Software' (OSS) can be ignored for the current purpose. Developers of both kinds can be easily considered one community regardless of their differences. I prefer the name 'Free Software Community' because 'Free Software' is based on a principled approach that software ought to be free, like free speech; 'Open Source Software' is based on the consequentialist notion that the approach produces the 'best possible' software. The effective outcome can be considered identical for the current purpose, so I use the terms interchangeably.

The Open Source methodology has been adopted in many other areas. The methodology is based on making the 'source' materials of a project publicly and freely available, then inviting the formation of a community of contributors (typically but not necessarily voluntary) to work independently at contributing to the specific aims of the project.

There is not the space here to fully explain the details of what FLOSS is, the practices that result from its approach or the dynamics of the community surrounding it. A large amount of information is easily obtainable online by searching any of the related terms. Wikipedia is an excellent source as there is a close ideological and collaborative relationship between both communities. Other general overviews can be found in Ming-Wei Wu & Ying-Dar Lin, 2001; Wolf, Miller, & Grodzinsky, 2009.

technologies grow and expand some will become over-efficient. This is when the ‘collateral damage’ of a technology is greater than its benefits. Illich illustrates this with medical technology. At first modern medicine started doing more good than its alternatives. Eventually, as its use took over all other forms of care for the sick, we find out that medical intervention also causes some harm (e.g. side effects). The response is more medical technology. Until we reach the state where the whole idea of health is understood in terms of the technology. The sick become the inputs for the system which is now an end itself, until the costs of sustaining the system are more than the benefits to human well being. The same happens when learning is replaced with education – a human activity is replaced by a consumable need. Cars create a demand for highways and traffic management. Higher travelling speed turns transportation into an end in itself, which then demands infrastructure at its service. When several technologies converge towards this point simultaneously, humans are reduced to be serfs of tools, life becomes an unfulfillable quest towards productivity and speed (Illich, 2001).

Illich’s suggested response is to temper our appetite for ever more technology and put limits to which technologies are to be allowed. Convivial tools are those tools which do not overwhelm and concentrate power. When a tool is convivial it is still under control of the user. Bicycles or hand drills, for example, expand the possibilities of action without limiting a person’s creative force. Illich is not against technology, but he wants to forbid those technologies that restrict humans’ possibilities for self-fulfilment.

Illich suggests libraries as prototypical convivial tools. While they still operate in a bureaucratized manner, this functional approach is at the service of self-learning. Simple sturdy trucks would also be allowed by Illich because of their flexibility, multiple uses and user maintainability. Today we could phrase this in Internet jargon and say that trucks are hackable. But Illich does not define strict criteria for what constitutes a convivial tool. Any form of transport faster than what pedal power can provide would almost always be forbidden, while simple hand tools would almost always be acceptable. In between, the conviviality of a tool depends on the aspirations of the community or region concerned.

For example the construction industry pushes the notion of housing as a consumable, which in turn demands criteria for what makes *adequate* housing. For the purposes of efficiency these *products* are universalised. Yet people living in the city, the savannah or the jungle have very different conceptions of ‘being at home’—the aspiration housing technology claims to satisfy. Building codes push and increase the productivity of the housing industry at the expense of homes built by their future occupants. Barn-raising, traditional mud huts, DIY home improvement, all are relegated as primitive, inefficient or inadequate practices. Yet we all feel more at home when our physical surroundings have something of our own work in them, when one’s own effort is reflected in their environment. Globally uniform expectations of *adequate housing* ensure that more people all over the world have adequate housing, and that less people feel at home in those houses.

FLOSS could also be considered a convivial tool. Mitcham (2009) argues that the four freedoms put forward by the Free Software Foundation limit Free Software in a convivial manner. That is, they do not limit the possibilities of use for the software. Rather, the four freedoms ensure that FLOSS remains under control of the user. Free Software can always be adapted and changed to specific needs and circumstances. The availability of the source code means that the tool is accessible in the sense of transparency. It can be used for learning by doing, and what is learnt can then be applied to other software tools and shared. Moreover,

features which could be disruptive can be removed or disabled, thus allowing one to choose what and how a tool is to be used.

The core aspect of Free Software that makes it convivial can be expressed as the ability of the user to make the tool one's own. From Illich's perspective, size, speed and complexity work against a tool's conviviality. But up to the time Illich was writing, size, speed and complexity almost invariably overwhelmed people. Very large objects cannot be under control without turning humans into appendages of machines. Fast cars are more dangerous and complex bureaucracies demand centralisation. In cyberspace, the intangibility of goods makes things different. Large complex systems can be distributed over networks with no central point of authority. Higher bandwidth speeds and larger data sets do not necessarily overwhelm the user, but can rather enhance his/her perception (cf. Verbeek, 2009). A diversity of tools with the possibility of recombining data sets expands the avenues for creativity. Unfortunately the possibilities of reinventing and constituting oneself digitally, of creating one's environment for oneself, are only available if the human-device network (in Latour's (1999) Actor Network Theory sense of the word network) which makes up a digital technology can be appropriated by the user. The limits such as those placed by the four freedoms of free software are essentially legal measures which prevent the technological system from developing away its appropriability for the sake of efficiency.

To give just one example: image manipulation software (IMS) is convivial if it appropriable by the community and the user remains in control of the meaning of IMS. So Open Source IMS is convivial because it does not constrain the user as to what use of the software is acceptable, nor does it demand a specific conception of the world. For example the GIMP (GNU¹⁰ Image Manipulation Program), an Open Source IMS, is available with at least two different user interfaces, can be used from the command line and a modified version for manipulating individual frames of a film has become a popular tool in feature motion picture work.¹¹ The software can be appropriated by making it fit one's own environment (or one's milieu).

Thus, to say that convivial software is software that a user can make one's own does not refer to legal ownership but to 'hackability', or to use Feenberg's (1999) vocabulary, to its possibilities for subversion. One might object that this possibility is only available to accomplished software engineers, not to the actual user. This is again the mistake of taking the user to be the mythical mom. The user can also be understood as a relevant community. How a technology becomes one's own depends on our understanding of the world around us. Our understanding of the world around us is at the same time modulated by the uses and appropriations we make of technologies. The ideologies within which the world, and technologies, gain meaning are social phenomena, therefore, in such a context, the user *qua* relevant community is a more appropriate conception than that of the user as a lone individual.

Conviviality allows us to understand what availability and exploitability of digital tools (specifically software) by a relevant community, requires. But how does this apply for the things tooled? Farming technology can be non-convivial (industrial farms) or convivial

¹⁰ GNU is a project by the Free Software Foundation involving diverse software components.

¹¹ See <http://www.gimp.org/features/>
http://www.gimp.org/tutorials/Basic_Batch/
<http://www.gimpshop.com/>
and <http://www.cinepaint.org/> for the various appropriations of the GIMP (Retrieved 11th Oct. 2010).

(community farming), but with regards to the thing farmed, the potatoes in my bag, the question does not arise. Besides the fact that potatoes are not a technology, one typically assumes that once I possess those potatoes I also own them in the full sense explained above.

On the other hand, digital goods, such as an eBook, are unlike potatoes, in that digital goods are expressions. “Expressions are extensions of ideas into the physical world. ... In fact, all man-made, intentionally produced objects are extensions (manifestations) of ideas into the physical world” (Koepsell, 2003, p. 91). With expressions, one only ever possesses a technologically facilitated manifestation of that expression. This allows for the decoupling of possession and ownership, and the emergence of such distinctions as between rivalrous and non-rivalrous goods. This leads to the possibility of restricting the appropriability of digital goods even when one already owns (and possesses) the physical manifestation of that good and appropriation is technically feasible. Such restrictions take the form of 1) either normative regimes (see Koepsell, 2003, for an extensive discussion of the implied ontology for digital objects in current intellectual property law) or 2) they take the form of non-convivial tools which drastically reduce the feasibility of manipulating the physical manifestation of the expression¹² to virtual impossibility. Often the two forms of restriction work in combination, as in the case of Digital Rights Management technology.

Digital goods are ontologically linked to their relevant technologies (Koepsell, 2003, p. 80), so the availability and exploitability of digital goods is determined by those technologies (viz. their code as in Lessig, 2006). Although the bits and bytes of the eBook you have are right there on your hard-drive, which you own and possess, the ways in which you can experience and manipulate that eBook are largely determined by the software you use. This does not mean that only convivial software can express convivial digital goods. Nor does it mean that convivial digital goods are impossible under any sort of intellectual property regime. However, it does imply that technologies expressing convivial digital goods need, at a minimum, to allow appropriation of the digital good in the same manner as is possible with convivial software.

I have described MBDGs as those digital goods that potentially support rather than inhibit the flourishing of the relevant community. They support flourishing in a manner parallel to that by which convivial digital tools do the same, by being appropriable. It is in this sense that an MBDG is available and exploitable by the relevant community. The characteristics of MBDGs that are most relevant to their political evaluation can now be explored by describing the process of MBDG appropriation.

Appropriation of Mutual Benefit Digital Goods

Michel Foucault uses the term ‘technologies of the self’ to mean a set of techniques and practices that can be deployed to modify or affect the self. Technologies of the self are an important aspect of his approach to morality based on virtue ethics and the ‘care of the self’ (Foucault, 1988). These techniques, which Foucault (1988) studies historically, are shown to change over time. Looking at some aspects of the intersection between information

12 The physical manifestation of a digital good is the individual bits and bytes in computer memory or on a hard-drive. By analogy a poem can be physically manifested as a piece of paper with print or as a carved slab of marble. The printed poem is more convivial because printed paper lends itself more readily to manipulation (e.g. by scrawling notes on the paper) than marble (on which writing down anything would probably be considered an act of vandalism).

technology and technologies of the self Rafael Capurro (1996) concludes with an important suggestion for a difficult question: “How can we ensure that the benefits of information technology are not only distributed equitably, but that they can also be used by people to shape their own lives? I think that the technologies of the self are an essential part of the answer to this question.” (Capurro, 1996). The description I have given of MBDGs should make it clear that they are fodder for technologies of the self. If following Capurro we ask “how can we ensure that digital goods are not only distributed equitably, but that they can also be used by people to shape their own lives?” then the answer is “by ensuring that digital goods can be appropriated by people” for appropriation of digital goods means exactly the use of that good in shaping one’s own self.

MBDGs can be classified by the way they are produced on a continuous scale from community produced (what Benkler and Nissenbaum, 2006 call Commons-based Peer Production) to those produced by a single individual. There are two major ways in which MBDGs can be appropriated, which more or less follow the production classification. One way of appropriating an MBDG is through meaningful work, and the other is by joining the production community. The methods of appropriation follow the production scale in the sense that the only way to appropriate a fully community produced MBDGs is by engaging the community. This is not necessary for MBDGs produced by a single individual, even if as soon as someone appropriates an MBDG produced by another person a micro-cosmic community of at least two people is created. Conversely, appropriating an MBDG produced by an individual does demand a significant amount of meaningful work. In this latter case engaging the production community can only happen properly at the meta-level, that is to say by engaging in discourse *about* the MBDG.

... through Meaningful Work

Making a digital good one’s own, using it to shape one’s life and world, means putting something of oneself in the digital thing, adding something, some value of one’s own, to it. Putting in something of one’s own implies work. One works with the digital thing, manipulates it, modifies it, translates it and by means of effort, by sweat of the brow, something new is created that is linked to the old. The new thing, another MBDG, expresses the manipulator’s creative force. It is such creative self-expression that asserts one’s identity in a social world. Self-expressive work can only contribute to shaping a person’s life, and the world, if he/she is free to choose the form that self-expression takes. MBDGs do not restrict the modality of expression, use, or manipulation.

An interesting feature of digital goods is that manipulation of the thing leaves the original untouched, and generates always something new, unless the original is explicitly destroyed by the technology used for manipulation. Such a destructive technology cannot be considered convivial. A digital good that depends on a destructive technology cannot be an MBDG. Thus exploitation of MBDGs is generative rather than destructive. To put it another way, appropriation excludes work that would squeeze away the appropriability-by-a-community from the given good. Appropriation through work is self-expressive. Self-expression that is not expressed towards others is a cry in the wilderness. Appropriation of MBDGs demands making the result of one’s work available to others.

... by Engaging the Community

One can also appropriate an MBDG by joining the community of production of that good. In this case the manipulation of a digital thing acts as a means for dialogue and exchange of ideas. Together, the community constructs its environment through discourse, and the discourse also yields a digital good. This mechanism is easily discernible in the Open Source approach. Two conversations occur at the same time, one in English on mailing lists, the other in C through the source code itself. The members of the community engage in constant exchange of self-expressions. The code reflects the discussions, and the discussions are shaped by the code. The technology and its grounding ideologies co-evolve providing identity to the community. Engaging such a community is a form of appropriation of technology.

Of course such engagement also demands substantial work. Whether contributing additional material to a digital good, or discussing its development in a forum, a substantial level of commitment and effort is required. Appropriation through work and by engaging the community are not exclusive, rather they are complimentary. But one can also appropriate a community produced MBDG without working on manipulating the good itself. This happens when one engages the community at the meta-level. In the case of Open Source development this would mean participating in the discussion about the code, but not in the actual coding. Similarly for mashups, one can be actively engaged with the community reviewing, rating, cross-linking and distributing, but not actually creating new mashups. In this way one appropriates the work of the community, even gaining a stake in the ownership of the ostensible output of the community. When someone is engaged, even marginally, with a community of production he/she owns the output of that community, say the software or the mashups, in deeper sense then the way anyone ever owns the audio on a CD or the story in a book.

It is important to emphasise that contribution by engaging the community does not require technical skill. So one can still be part of the community of production of software without knowing any programming. An analogy from a 'barn raising' type of activity helps to illustrate this. Imagine an old lady boasting how beautiful a new house of worship is. She would say "we built this house of worship with our own hands". A cynical neighbour comments that she cannot claim to be part of that 'we' which built the structure, as she has no carpentry or other construction skills. She responds: "Aha! But I made sandwiches for all the hard working men, and baby sat their kids". So even without any construction skills, the building is hers, her own work, as well. The old lady is an integral part of the community, and the house of worship is built by the community as a whole, not just the people wielding hammers.

When one cites an article from Wikipedia the author is "Wikipedia Contributors". When one participates in the Wikipedia community, in any of the different ways this is possible, one becomes a part of the collective author of each and every article, including the meta-content which describes the aims and policies of Wikipedia. The relationship of a Wikipedia editor to Wikipedia as a whole is not dissimilar to that between a football club and a subscribed member of that club or of a resident to her/his municipality. Talking about 'us' winning the game or building a new house of worship is common, and meaningful, even if the speaker is not directly involved in such activity.

When a community of production of a digital good is engaged by someone without technical skill that someone is still modifying that digital good into a new instance. He/she does not do

this by manipulation of the good directly but by modulating its environment of production. Being part of a community means being shaped by, and having influence upon the shape of, that community. This influence can be exercised in a variety of ways, through direct action of course, but equally importantly through discourse and also through ancillary activity that ensures the flourishing of the community. Appropriation by engaging the community is a form of appropriation where one asserts his or her identity by association. By engaging a production community at the meta-level one asserts a world-view compatible with that of the community and claims an interest in the benefits of the good produced.

Posterity and Common Heritage

One other characteristic common to MBDGs is their inclination towards the interest of posterity. Non-convivial tools are also problematic because they commit future generations to an ideology shaped by technologies which address only present demands. Inversely, MBDGs need to preserve their malleability for the future. This requires that the framework for meaning within which they arose is preserved. To safeguard the benefit potential of a digital good its lineage and heritage need to be publicly available as well. By understanding the genesis and evolution of a digital good it can be reinterpreted meaningfully in a distant context, whether distant in space or time.

For example, a piece of music carries a specific meaning only within a particular cultural context (such as reggae music's relationship to Rastafari spirituality). A cultural context includes the history and heritage of the society concerned. Preserving the historical background of musical development of a society requires a lot of effort, yet several institutions exist for just such activities. In Bob Marley's words "If you know your history, Then you would know where you coming from, Then you wouldn't have to ask me..." Appropriation requires a sense of self-grounding in a historical context. Keeping a record of appropriations themselves is one way of providing such a context.

Luckily MBDGs can evolve without destroying their progenitors. A full record can be maintained without much effort. By keeping copies of the entire lineage of an MBDG an archive is available for posterity to explore and with which to interpret the goods at hand. Services like The Mail Archive¹³ stores thousands of discussions each day and preserves them for future reference. The scale of such an operation is unprecedented and could not be practically achieved without digital technology. This is similar to public libraries archiving daily newspapers. But it is not just the scale that is different. Newspapers and other paper based expressions need to be 'translated' into micro-film (or nowadays digitised). MBDGs are 'archive ready'. Because they are digital, it is the digital goods themselves, or the actual discussions about them, that are preserved. A digital good that explicitly impedes such archiving is not an MBDG. Interestingly, once a discussion about a digital good (typically in the form of a thread of digital messages e.g. e-mails and blog posts) is archived it too can become an MBDG in its own right.

The archive readiness and appropriability of MBDGs have another politically relevant effect upon the milieu of cyberspace – they give rise to a growing pool of resources. Lessig (2005) has discussed at length the idea of a digital commons akin to the commons of pre-industrial societies. Lessig only discusses the pool of goods in terms of ownership, rights of access and

13 See <http://www.mail-archive.com/> (Retrieved 11th Oct. 2010).

rights of use. Lessig and others developed a set of licences, the Creative Commons licences,¹⁴ which allow an author to place his creations in the commons. This makes the Creative Commons a commons by choice as described by David Koepsell (2009, pp. 119-136). In exploring the possibilities of owning the Human Genome, Koepsell distinguishes between commons by choice from commons by necessity. Commons by choice refers to those things which are purposefully designated as belonging to a commons for useful and pragmatic reasons; e.g. copyrightable material where the copyright term has expired and is now in the public domain. One could imagine extending copyright indefinitely, but up to now, the societal benefit derived from a commons of public domain literature has outweighed the benefits of an indefinite copyright term. Commons by necessity refers to those things which simply cannot be enclosed or held e.g. the radio spectrum cannot be owned in any meaningful sense. The radio spectrum is in fact regulated, rather heavily too, but this is to avoid a tragedy of the commons, not because governments can claim any right of ownership upon radio waves.

Most digital content licensed under a Creative Commons licence which allows derivative works would in fact be an MBDG. But MBDG is intended to capture more than authored content as it depends on user possibilities and builds upon a discursive rationality rather than a notion of natural rights. The universal pool of MBDGs¹⁵ in effect creates a commons, but is this a commons by necessity or by choice? Since every MBDG is an intentionally created expression of an idea it seems that such a pool is a commons by choice. When an author puts a Creative Commons licence on their digital art, or an Open Source licence on software, and offers it to a community, the author is *choosing* to place the work in the commons.

But the pool of MBDGs is more similar to that of entities covered by the principle of a Common Heritage of Mankind. The principle forbids appropriation by nations or individuals, but it is appropriation in the sense of possession that is forbidden, and not convivial appropriation. Because the nature of digital technology depends on perfect replication, an MBDG can spread like a virus in the wild. In practice, once a digital copy of some content is 'out there' on the net it is almost impossible to enclose it again (cf. Black, 2005; Wallach, 2001). This is of course not a problem for the creators of the content, as they placed their content in the wild voluntarily.

Once an MBDG spreads in this manner it can no longer be considered in the commons by choice. That is to say that neither the creator nor any community can circumscribe that good for their exclusive use. This is not a commons by *logical* necessity, but should still be regarded as commons by necessity in that the technical means to circumscribe such goods would, while conceivable, need to be so draconian, and counter to generally accepted world views, to be practically unimplementable. The ocean floor has shifted in the other direction. Before the invention on nuclear submarines the deep ocean floors belonged to the commons by necessity simply because the technology to enforce any sort of ownership claim belonged to science fiction. The notion of a Common Heritage of Mankind serves to maintain the ocean floors in the commons, now that submarine technology has made this into a choice.

This reveals an important feature of MBDGs. For a digital thing to transit from something belonging to a commons by choice, such as through Creative Commons licensing, to a commons by necessity, all it needs to do is spread on the internet beyond some threshold of

¹⁴ See <http://creativecommons.org/> (Retrieved 11th October 2010).

¹⁵ Whether a good is an MBDG or not depends on the relevant community, so here 'the universal pool' means something more like the set of sets in contrast to all the extant MBDGs as one class.

spread which makes re-enclosure impossible. All MBDGs have this virulent character to some extent. The political implication is that if there is a community that can draw benefit from a common pool of digital resources, that pool ought to be given similar protection as given to the oceans from pollution through a principle such as that of the Common Heritage of Mankind. If such pools do not benefit from such protection, technologies which we today might consider science-fiction or draconian and anti-democratic (such as the Great Firewall of China¹⁶) might develop in such a way that it would become almost impossible to benefit from digital goods without ownership disputes. This would be most detrimental to those communities which currently stand to benefit most from MBDGs.

Limits to Mutual Benefit

If MBDGs, by virtue of being digital, can be replicated, transmitted and manipulated without affecting the original, why are not all digital goods MBDGs? Digital things only exist as MBDGs when expressed by technologies within a social context which enables their convivial appropriation. This context is made up of a complex mesh of technological capability, moral norms and social conventions which together provide a framework for the formation of meaning. This social context also gives rise to other systems such as laws and markets. These systems, combined with the spatio-temporal and economic reality of the user community, can place limits on the potential for appropriation of digital goods. Taking a look at some of these limitations will enrich the description of MBDGs by negation.

Legal Limitations

Are MBDGs legal? As odd as this question might sound, under the present legal systems of most, if not all, nations and under international law any convivial appropriation of a digital good is illegal, unless the creator(s) of that digital good explicitly allow its appropriation through a licence. All things digital, being expressions of creativity or ideas, fall under the purview of intellectual property law. Specifically, all expressions are copyrighted by default. This gives the creator(s) almost exclusive rights to determine the way in which digital goods may be used. These rights include the power to prohibit modification and redistribution which are essential to appropriation.

The appropriation through work of digital goods depends on forms of manipulation that are typically forbidden unless the manipulator obtains prior permission from (enters a contractual agreement with) the author. The sort of replication that safeguards the interests of posterity and makes digital goods readily available to a community is also typically forbidden. The prevailing intellectual property regime compels individuals to conform their creative force to the demands of legal bureaucracy. In theory one still has the full freedom of creativity once permission is obtained, but in practice the rigidity of this system makes all but a few digital goods appropriable. Worse still, individuals have to first serve the system before they can obtain the benefits, and still they are at the mercy of the whim of the author.

¹⁶ The Great Firewall of China refers to China's system for censoring the Internet by using firewalls, manpower, and political pressure to force multinational corporations into compliance (Elgin & Einhorn, 2006; Taylor, 2006).

Technical Limitations

If an image is so large that it will not fit in my computer's memory there is no way I could appropriate it. This simple point illustrates technical limitations to MBDGs, but it should not be taken as calling for strictly specified technical requirements. It would be a mistake to assume that MBDGs are only those that can be manipulated on, say, a typical home computer. Only the mythical mom uses a typical home computer. All of Wikipedia can be considered a single big MBDG (with the caveat of its image collection) but it is not practically feasible to modify it on a home computer. The point to be made here is that MBDGs should be practically usable without the need of non-convivial tools.

The use of standard formats is another practical technical requirement. The Free Software community tends to stress the importance of formal standards. But *de facto* standards also allow for convivial appropriation, as long as such standards are also appropriable. In fact, the bureaucratic overload of some international standards organisations might prove counter to the aspirations of a convivial community. MP3 technology offers an interesting example. The MP3 format cannot be considered a technical limitation for it is publicly available and several FLOSS tools for manipulating MP3s exist. Yet it is encumbered by patents which are a legal obstacle to appropriation (Lemley & Shapiro, 2007). The PDF¹⁷ format also poses a problem. PDF is typically a read-only format, so PDFs cannot be obviously manipulated. But there are FLOSS tools available that do in fact allow you to modify a PDF. The important point is that the kind of manipulation that appropriation demands is not the direct manipulation of the bit stream. If a PDF contained mostly text which can be easily copied and pasted, then edited, or contains knowledge that one is free to cite and re-apply, then the format is not really an impediment to appropriation.

In evaluating the mutual benefit potential of a digital good one requires a feel for the technology—a capacity to understand for oneself the art of digital living, to borrow Foucault's phrase. My personal experience of music circulation on the internet, for example, leads me to consider the limitation imposed by the patents on MP3s as largely irrelevant for my personal use, but still pushes me towards preferring the OGG¹⁸ format when available.

Finally, technical limitations can also be embedded as code in digital tools. Digital Rights Management (DRM) is a prime example of this kind of limitation. If the software pre-determines what can or cannot be done, there is no freedom of creativity. Internet filters are another kind of limitation that can be externally imposed. In short, code which restricts the users' possibilities are generally limitations of appropriability.

Personal Limitations

Let's face it, participating in any community can at times be wearisome. If engaging a community places unreasonable demands upon a person it cannot be considered properly an appropriation of an MBDG. Appropriation involves putting something of one's own into the digital good. Unreasonable demands to engaging a community of production would be such

17 The Portable Document Format (PDF) is a popular standard file format for exchanging documents independently of application software or hardware while retaining layout information accurately and reliably. It was created in 1993 as a proprietary format by Adobe System but became an ISO standard in 2008

18 Ogg Vorbis (aka OGG) is a file format with equivalent functionality as the popular MP3 format. OGG is technically superior in certain respects to MP3 and has no patent or other intellectual property restrictions to its use. Unlike MP3, OGG is not in very wide spread use, and most stand alone music players do not support this format. See <http://www.vorbis.com/> (Retrieved 11th Oct. 2010).

demands that would deny the individual a life beyond that community. If a digital good is only appropriable through engaging its community of production, then that community cannot be exclusive, either through norms or technical barriers. If a digital good can be appropriated in differing ways, then its community of production can afford to be exclusive. Individuals wishing to reap benefit from that good without abiding by the norms of that community can simply appropriate that good directly, through work. On the other hand, a digital good that cannot be appropriated without engaging its community cannot be considered of mutual benefit if its community of production is exclusive on the basis of such things as gender, religion or wealth. MBDGs have to be appropriable by *all* individuals within their relevant communities.

The user also needs to be physically capable of participating. A blind person cannot, in the normal sense, manipulate an image, therefore the blind are automatically excluded from the relevant communities of mutual benefit digital images. The same applies to the person's skill set. While the source code of the Linux kernel¹⁹ is an MDBG for kernel hackers, it is not appropriable by digital photographers – they simply do not possess the technical skills necessary to contribute meaningfully. Again, a pragmatic, shifting window approach is called for in this case. Consider the case when kernel hackers are programming a module for calibrating screen colours. The primary beneficiaries of this code will be digital photographers, so at that juncture the two relevant communities overlap. The sliding window nature of relevant communities and the fact that every individual MDBG transverses several such communities make it possible to still speak of a universal pool of MBDGs.

The problem of relevant skills posing a limitation to MBDGs becomes significant if the only way to acquire these skills is through a non-convivial system of formal training. If there is at least the possibility of learning the required skill by exploring other MBDGs or participating in their production, then the limitation is only a contingency of an individual's own history, not an inherent limitation of the mutual benefit potential.

Some Examples of Mutual Benefit Digital Goods

Before concluding this chapter it is worthwhile looking at some examples of potential MBDGs and how they follow this general schema.

Open Source Software

As already discussed, Mitcham (2009) describes Open Source Software (OSS) as a convivial tool, but besides being a tool, software is also a *thing*. In this sense OSS is the premier MDBG. It can be appropriated through meaningful work. Eric Raymond's (1999) justification for contributing code—to scratch an intellectual itch—is one way in which self-expression can be fulfilled through code. OSS's approach is also community based. In a collaborative programming environment code develops like a conversation, while on mailing-lists vivid discussions in English determine the direction of development. At the meta-level, bug reports, OSS evangelists, support forums, etc. create a complex social network where participants express their own identities in relation to the technology to which they contribute. OSS is licensed in such a way that makes it legal to appropriate the software in any way. The various

¹⁹ The kernel is the core part of an operating system, i.e. software that makes various hardware usable to other software such as user applications. Hacking (in the sense of complex programming, not of gaining illegal access) the kernel is considered one of the most technically abstruse kind of programming.

OSS projects have distinct communities, but several of these overlap and interact. Projects such as Ubuntu aim specifically at bringing these various goods together and provide a coherent mega-good with its associated overarching community.

The most obvious limitation to appropriating OSS is the high level of technical skill that is needed to start contributing code, especially for larger projects. This limitation can be removed in two ways. First, one can participate at the meta-level. With communities and goods as intricate as OSS there are many levels and opportunities for contribution. Almost any skill-set can be used for appropriation. Second, all the skills that are required can be learned from the community itself, either through experimentation or from the learning material the community produces.

Creative Commons

The Creative Commons here refers to all the content and media licensed under a Creative Commons (CC) licence and readily available online (CC licences can also be applied to non-digital content). The Creative Commons licences disarm the limitations imposed by intellectual property law to the appropriation of a digital good. Thus, most of the Creative Commons ought to be MBDGs.

There are a few important exceptions to consider. The most significant are those digital goods that include a No-Derivatives clause in the licence. This clause means that the material can be copied and distributed, but cannot be modified. If the content cannot be modified it is not possible to do meaningful work with the material. One could still appropriate it by engaging the community, but if no member in the community can modify the good it is no longer a community of production. Such a community is more like a fan club. In the special case that the author(s) of the No-Derivatives licensed work is part of the community, then that material can still be considered an MBDG. Another special case is an archive of No-Derivatives licensed works. While the works by themselves are not MBDGs, if the archive is maintained by an open community and it is modifiable, then the archive itself can be considered an MBDG.

Another common limitation to the appropriability of CC licensed work is that of file formats. Several highly valuable digital goods are freely available under a CC licence but cannot be considered an MBDG because their file format depends on non-convivial software for expression. Luckily, a simple conversion to an open format is often possible with little loss. Such a conversion would in fact be an appropriation through work creating a new MBDG once redistributed.

Wikipedia

The Wikimedia Foundation's various projects are a treasure trove of MBDGs. Each single article can be considered an MBDG in and of itself, with its own community, forum and history. Each Wikipedia language is an independent project with slightly varying policies, rules and traditions, yet all Wikipedias feed off each other's work. Another project is Wikimedia Commons which provides millions of images with sub-communities working on such projects as collecting and cataloguing coats of arms while translating them into an open format. And all of the projects under the Wikimedia Foundation's umbrella, when taken all together are another, single, huge MBDG.

But even here we encounter some limitations. When Wikipedia as a whole is considered as a single MBDG one has to keep in mind that this excludes its images. The database containing all the text and data is made publicly available, such that Wikipedia could be replicated by an independent third party. The image collection, on the other hand, is so large that, even if theoretically possible, the community does not have the resources to make it replicable in its entirety as one thing. Of course this is really a minor impediment, a more serious threat comes from the internal bureaucracies of Wikipedia. In some cases, these have started to resemble the centralised bureaucracies of the industrial sphere. While appropriation still remains possible, engaging with the community is, in some particular instances, becoming more burdensome than fulfilling. Still, Wikipedia can be considered an iconic non-software MBDG.

Open Access Academic Journals and Open Education Resources

The problem with determining the mutual benefit potential of Open Access academic journals and Open Educational Resources is that these names are buzzwords and it is unclear what they actually entail. In the case of Open Educational Resources a good rule of thumb is that most mutual benefit educational resources are either licensed under a Creative Commons Licence or developed on the model of Wikipedia.

The case of Open Access Academic Journals is more complicated to judge. Most freely available articles have restrictive licensing terms which make them non-appropriable. On the other hand if the good under consideration is not the digital article but the scientific knowledge, and the relevant community is the scientific one, the practices of referencing and peer review would describe a sort of pre-digital mutual benefit practice. The scientific community as described by Popper (2002) prides itself in its sharing, action guided by reason and replicability. Patently, the scientific community is exclusive, and one can join the community only through formalised training.

In spite of these limitations, when academic publishing goes digital in the form of Open Access with permissive licensing, and provides access to archives of raw research data, the scientific community starts crossing the gap to become a community of production for MBDGs.

Mashups

Mashups are the most explicit forms of self-expression through appropriation that may be encountered online. Art as self-expression is a well recognised phenomenon. These bits of creativity are produced by making other's readily available work one's own. Mashups are peculiar because single instances are typically the work of one individual. There is little if any community production of mashups. That said, there are meta-level communities surrounding mashup genres and sub-genres. For example, most of the works on AnimeMusicVideos.org²⁰ are produced by a single individual, but the site is much more than a hosting service. It is home to a large and interactive community. The website and its forums provide a space for users to comment and provide support for each other's work, and to discuss aspects of the community itself. This is a nascent art form and most of the exchanges are specific to the production of anime music video mashup sub-genre itself, but a quick browsing of the forums reveals that a use of this art form for social comment is emerging. Unlike traditional art forms

20 The site declares "This community is dedicated to the creation, discussion, and general enjoyment of fan-made anime music videos" (AnimeMusicVideos.Org, 2010). An anime music video is a music video made of clips taken from one or more cartoons and set to songs or other audio. These are produced by amateur fans of the original works. They are not official music videos released by the musicians.

the focus is not on pure originality, but on the creative reuse of digital resources available ‘out there’.

Probably, the most significant limitation to the appropriation of mashups is that they challenge the intellectual property regime upfront. Social norms seem to make any work that so readily challenges the ideological regime less valuable.

Blogs and Folksonomies

If a blog has a static archive then it can be considered a record of current events, similar to newspaper archives. The archive as a thing is an MBDG if it is appropriable, but such appropriation only makes sense for rare remarkable events such as postings by notable persons, which, with the responses and discussion, can be cited or referred to in other contexts.²¹

The very dynamic nature of many blogs and of folksonomies²² make them very volatile and abstract entities to evaluate. A deeper analysis of their ontology is needed before their status as MBDGs can be determined. It is suggestive that on a phenomenological level they seem to behave in a similar way to other MBDGs described above. In the case of folksonomies, even if they are very much community produced it is difficult to say how they are meaningful in and of themselves without reference to the datasets that underlie them.

Conclusion

To recapitulate, I have described digital things as digital objects that are meaningful in themselves, independently of the technology that undergirds their existence. Digital goods are those digital things that have value for the relevant community. Digital goods that can be appropriated without depending on non-convivial tools I called Mutual Benefit Digital Goods. The notion of mutual benefit is inspired by Kropotkin’s theory that survival of the species depends more on the individual’s capacity to contribute to, and extract benefit from, the community than on the individual’s ability to outdo its kin. The notion of conviviality which

21 For example, The Tanenbaum-Torvalds Debate was a technical, but emotionally charged, debate about the design of operating system software. It occurred in 1992, in the very early days of Linux’s development, between Linus Torvalds, the then very young creator of Linux, Andrew Tanenbaum, a professor of computer science at the Vrije Universiteit in Amsterdam, and others. This debate has entered the lore of the Open Source community and can be considered an important part of its documented history. It has even been published as an appendix to a book about the Open Source movement (DiBona et al., 1999, appx A).

22 Different definitions of folksonomy can be found which imply differing ontologies. A definition like this: ‘Folksonomy is a portmanteau of “folk” and “taxonomy”. It describes ‘an organic system of organization ... that is comprised of terms in a flat namespace: that is, there is no hierarchy, and no directly specified parent-child or sibling relationships between these terms. There are, however, automatically generated “related” tags, which cluster tags. ... These folksonomies are simply the set of terms that a group of users tagged content with, they are not a predetermined set of classification terms or labels.’ (Mathes, 2004, pp. 3-4) implies that the folksonomy is the collection of terms itself i.e. a digital object.

An alternative definition such as: “Folksonomy is the result of personal free tagging of information and objects (anything with a URL) for one’s own retrieval. The tagging is done in a social environment (usually shared and open to others). Folksonomy is created from the act of tagging by the person consuming the information. ... The value in this external tagging is derived from people using their own vocabulary and adding explicit meaning, which may come from inferred understanding of the information/object. People are not so much categorizing, as providing a means to connect items (placing hooks) to provide their meaning in their own understanding.” (Vander Wal, 2007) implies that a folksonomy is a form of shared knowledge (akin to folklore) and the tags are just the objects which represent that ‘folklore’.

leads to the criteria of appropriability is drawn from Illich's critique of the destructive over-efficiency of instrumentalist ideology. Convivial tools do not restrict their users, but allow for the full expression of their creative force. In informational goods this creative force takes the form of self-expression.

Appropriation means to make the digital good one's own, either by self-expressive work which adds something of oneself to the new instance of the original, or as an assertion of one's identity in relation to the digital good within its community of production. To further crystallize this notion I explored some of the limitations that the potential for mutual benefit in digital goods can face. Next I described some potential MBDGs in terms of this schema.

The next step is to uncover the politics of MBDGs. The next chapter explores the notion of democracy in the context of cyberspace, before returning in the third chapter to the politics of digital goods.

— 2 —

Democracy for/in Cyberspace

In order to be able to identify which digital goods have potential for nurturing democratic virtues in their users the category of MBDGs was developed in the previous chapter. The next issue that needs to be addressed is what democracy means in such a context. The notion of democracy can take various forms. When speaking about democracy in relation to digital technology is it important to use a conception of democracy that is meaningful in cyberspace.

One family of theories of democracy, those of deliberative democracy, are grounded upon an understanding of rationality which is based on theories of communication. These include ideas like Habermas' Theory of Communicative Action (see Edgar, 2004), or Dryzek's (2002) notion of Discursive Rationality. These deal with human communication and the exchange, use, effects and/or construction of information (and facts). ICT is technology that stores, manipulates, moves, and expresses information and/or communication. I shall, therefore, put forward the deliberative version of democracy as possibly the most well suited to the task.

A comparative evaluation of the major conceptions of democracy for their 'fit' with cyberspace would indeed be recommended for making this analysis more complete. On the other hand, Gutmann and Thompson provide solid argument why deliberative democracy is better than other theories of democracy generally (Gutmann & Thompson, 2004, pp. 13-21). Additionally, most alternative theories of democracy are based on utilitarianism which, as will be argued in the next chapter, faces significant problems in relation to complex technologies. Other theories based on majoritarianism demand a fair and reliable system of preference aggregation. In cyberspace the very concept of identity is problematic, let alone fair systems of preference aggregation. Not that such a system is necessarily impossible (even if the current state-of-the-art means that it is, minimally, a very hard technical problem) but until such a system emerges majoritarian governance of cyberspace is not feasible. For the present purposes, focusing on a theory of democracy grounded in theories of discourse is the best approach as the digital goods of interest (MBDGs) are also categorised on the basis of a discursive rationality.

After giving an overview of what deliberative democracy is, I shall argue why democracy is relevant to cyberspace, and vice versa. Next, I shall discuss some of the problems with transposing notions of democracy to cyberspace. After suggesting how these difficulties can be overcome by shifting the focus of deliberative theory towards its linguistic/productive elements rather than its decisional aspect, I will be able to give a condensed description of deliberative democracy which highlights the salient features that make it meaningful and potentially useful for discussions about democracy with regards to digital goods and cyberspace.

Democracy, in its simplest form, is the governance of people according to the will of those governed. For government to be "for the people, by the people", the people need to participate in the democratic process. But what if the people are uninterested? This is not to say that people merely do not care, or do not vote, the problem may be that the governing institutions are distant from those they govern.

As the governing elites put forward goals of an 'information society' for their peoples, it is rather trivial to see why one of the instruments to be deployed in bridging this distance is the internet. eDemocracy programmes and projects purport to decrease the democratic deficit in a causally linked manner: an eDemocracy will allow representatives to know what the people want. For example:

Today Information and Communication Technologies (ICT) can play an essential role by making EU citizens' participation in policy and political processes possible on a very large scale. Modern communication technologies, in particular the Internet, can empower decision-makers and citizens alike for a more informed and democratic engagement. ICTs are able to bring about more transparency and better information. They also can help engage citizens and provide the tools for better, simple, direct two way communication.

Viviane Reading, Commissioner for Information Society and media, European Commission in Lucarini, Caiola, & Carrieri (2009, p. 3)

I contend this vision is too limited. Instrumentalist use of digital technologies to affect the readings of scientific markers on some 'democracy scale' might in fact be efficient, but it does not go to the core of the problem. One must consider the possibility that the disconnect between governing elites and the people is not one of efficiency of communications, not a problem of the messages not getting through, but a problem of differing meanings and conceptions. The very meaning of democracy itself is a complex matter upon which there is substantial disagreement. Looking at how the people of the information society self-govern (when they in fact do that) and formulating our understanding of democracy in line with that practice is a first step in resolving such disagreement in the context of cyberspace.

The Deliberative Poll

The term 'deliberative democracy' encapsulates a theory which features several variant flavours and a selection of practices that either attempt to implement or are inspired by the theory. Providing an answer to the question "what exactly is meant by deliberative democracy?" is problematic. A satisfactory answer to such a question would require an exploration into recent development of political thought, starting from Rawls and Habermas up to contemporary writing, and a detailed explanation of communicative rationality which is beyond the scope of this inquiry. Still, deliberative democracy itself, properly taken, would not be subject to strict normative definition but is conceivable only through its own exercise. I will instead start by example. The 'Deliberative Poll' as implemented by Fishkin (2009b) might be considered an exemplar approximation of what a deliberative democratic process ought to be. None of the examples put forward by advocates of deliberation would ideally fit any flavour of the theory. Nevertheless they are very useful approximations. Looking at Fishkin's exemplars will highlight both the fundamental principles of deliberative democracy and the limitations of underlying notions for application to cyberspace. This approach can be thought of as a reverse engineering approach.

Fishkin's approach is pragmatic, showing by empirical evidence from various cases that deliberation works. His examples are varied. They include an exercise for choosing which candidate to put forward for mayor of Athens (Fishkin, 2009b, p. 6), working with minorities such as Aboriginal communities in Australia and Roma people in Bulgaria (Fishkin, 2009b, p. 163), and even a large scale exercise addressing several Europe-wide concerns across various cultures and languages (Fishkin, 2009b, p. 185).

The Deliberative Poll was developed to meet two important criteria for democracy: providing voters with relevant information about public policies, and providing the opportunity for citizens to discuss that information with others who hold differing views. The Deliberative

Poll is also designed so that the resulting changes in views can be measured. On the surface, a Deliberative Poll is conducted in a similar way to public consultation exercises such as focus groups or public debates, but there are important differences in the details.

A deliberative poll begins by interviewing a random sample of the population. Following the interview, respondents are invited to come to a conference centre for a weekend of face-to-face discussions and are sent a balanced package of background information to encourage learning and thinking about an issue. These materials are made available to the general public and are often certified by an advisory board for balance and accuracy. During the weekend, discussions are held in randomly assigned small groups chaired by an impartial moderator, and they alternate with question-and-answer plenary sessions with experts and policy-makers on the issue. After a weekend of information and discussion, in both small groups and plenary sessions, participants complete the same questionnaire as when first contacted. In this way, a deliberative poll can measure the extent to which opinions change as a result of exposure to information and discussion.

(Fishkin et al., 2000, p. 659)

The use of random sampling, the provision of a carefully crafted and balanced information pack, the direct querying of experts by participants and the scheduling structure are key components differentiating Deliberative Polls as an alternative approach to consultation rounds, focus groups or issue specific referenda. Also significant in a Deliberative Poll is the role of impartial moderators. They have the task of helping participants in proper deliberation. The moderators assist the discussion to flow in an orderly fashion, according the principles of good deliberation, without pressuring participants towards consensus. In a Deliberative Poll there is no set target for reaching a final common conclusion by a set time and date. Disagreement is acceptable, indeed expected. The aim is to discover what the opinion of the participants is under conditions of proper deliberation and with the availability of good information. Fishkin's research reveals that opinions under such conditions do differ from participants' opinions in non-deliberative contexts.

Changes in opinion have often been substantial. Whereas the 'before' results are just like those from any other random survey of public opinion, the 'after' figures represent what public opinion would be like if everyone had an opportunity to become informed by experts on all sides and to reflect on issues by discussing them with people of diverse views.

(Fishkin et al., 2000, pp. 659-660)

In politics, at some point, binding decisions on a common course of action have to be taken, typically under conditions lacking consensus. The Deliberative Poll defers this to traditional political structures (e.g. government executives or elections), but the decision takers (be they voters, or executives) have a better understanding of the public's opinion upon which to take their decisions. Thanks to the exercise of the poll itself the general opinion, even if it includes disagreement, is typically closer to the ideal of consensus.

Fishkin's experiments and approach have been shown to be effective under different political structures from the USA to China. Like any democratic processes ought to do, the

Deliberative Poll can be said to be an attempt at approximating some ideal decision making scenario.²³ Still, in every case these exercises function within the framework of established political systems and governments, be they market liberal or communist, all having differing understandings of democracy, yet typically based on some form of utilitarianism.

The Deliberative Poll addresses some problems of classical approaches to democracy. It is an approach that allows members of the public to have a real say in the political decisions which affect them. By using scientific random sampling representation can be obtained without depending exclusively on the goodwill of elected fixed term professional representatives. A representative microcosm of the public is obtained with careful sampling. Deliberative Polling also provides for participation in a fuller sense of the word. Not every single person is participating, as would be the fact in the case of a referendum, but anyone could potentially be a participant. Moreover, the participation is at a deeper, more engaging level. Casting a vote can barely be considered to be political participation. When voting one only has the option of endorsing or dismissing a pre-formulated course of action and the vote is not necessarily cast upon deep reflection. Through deliberative exercises one has the real opportunity of influencing the proposal under consideration. The Deliberative Poll makes the voting better informed and therefore more fair.

The format of the Deliberative Poll immediately highlights the importance of discourse and reason, rather than negotiation and tallying of opinion as a means to common will formation. Rather than a cost/benefit analysis, dividing participants into supporters of and opponents to some planned action, the participants are elicited to demand from the experts the relevant facts that can help them move closer to a common course of action. When participants have to make their final choices after the poll, these are almost always multifaceted, including a variety of options and combinations rather than the simple yes/no possibilities typical of referenda.

The Deliberative Poll brings to practice, albeit in approximate manner, the fundamental principles of deliberative democratic theory. In a democracy the public needs to choose between conflicting courses of action in order to address some shared problem. The result will invariably be less desirable to some than it is to others. It is therefore best to find a course of action that is at least acceptable to all, even if undesirable to some. The Deliberative Poll provides substantial amounts of information to participants so they can make a reasoned judgement; coordinated discussion leads to the consideration of different points of view; random sampling deals with the problem of considering a wide range of positions while overcoming the logistical impossibility of hearing every single voice. An action is acceptable if it can be justified by reason. That means that a public action needs to be justifiable to the person whom it affects on the grounds of reasons that are comprehensible to that person. Since this has to apply to all the individuals affected, the reasoning has to be discursive (in the sense of inter-subjective communication) and public.

Deliberative Rationality

As can be inferred from the practice of Deliberative Polls, deliberative democracy takes very seriously the core democratic principle of reciprocity. "Reciprocity holds that citizens owe one another justifications for the mutually binding laws and public policies they collectively

23 Habermas' (2004, p. 158) 'ideal speech situation' would be such an ideal. Another ideal could be Rawls' counterfactual 'original position' (see Freeman, 2008).

enact” (Gutmann & Thompson, 2004, p. 98). The Deliberative Poll, as a procedure, generates such justifications. The responses to contestations of claims made by either experts or fellow deliberators must result in justifiable claims.

In Joshua Cohen’s classic statement of the principle of deliberative legitimacy, decisions are only legitimate “if they could be the object of free and reasoned agreement among equals.” Deliberation, according to Cohen, involves parties advancing reasons for accepting or rejecting proposals. The form that reasoning takes is important. Deliberation must not be “constrained by the authority of prior norms or requirements.” Rather, it is the “force . . . of the better argument” that should prevail. Thus deliberation promises to consider and give proper force to arguments that are advanced by all groups, no matter how marginalised, or how small their relative power.

(Knops, 2006, p. 595)

Such examples and experiments make clear what the proper process of deliberative democracy should look like. Deliberative practice shifts the modality of democracy from one of competition to one of collaboration. Fishkin resolves five criteria for evaluating the quality of deliberation:

- **Information:** *The extent to which participants are given access to reasonably accurate information that they believe to be relevant to the issue*
- **Substantive balance:** *The extent to which arguments offered by one side or from the one perspective are answered by considerations offered by those who hold other perspectives*
- **Diversity:** *The extent to which the major positions in the public are represented by participants in the discussion*
- **Conscientiousness:** *The extent to which participants sincerely weigh the merits of the arguments*
- **Equal consideration:** *The extent to which arguments offered by all participants are considered on the merits regardless of which participants offer them*

(Fishkin, 2009b, p. 34)

Such criteria determine if the process or exercise can claim to be deliberative, and hence democratic. Yet, Gutmann and Thompson (2004, pp. 95-98) are at pains to overcome the distinction between procedural and substantive values within the theory. In liberal democracy, structured upon some principle of utility, one can distinguish actions based upon whether they have been chosen democratically and on whether actions satisfy the utility principle. Undemocratic choices can benefit society too, and democratically chosen actions could still cause more harm than good. Under deliberative principles, a choice is democratic if it is justifiable to those it will bind. Its moral value will be judged on a plateau of norms that is meaningful to all those that acquiesce to the action. Arriving at a shared moral landscape and the means of arriving there are all part of deliberation itself. One cannot conceive deliberation without some shared set of norms, both substantive and procedural, but which specific values need to be held in common is not fixed by the theory.

The only idea deliberative democracy depends on is some notion of rational argument. This exclusive dependence has two major implications. First, it highlights the flexibility of deliberative democracy. Even if all the various theories of deliberative democracy include some basic principles, it is only the notion of a rational argument that is fixed. While theories of rational argument like those put forward by Habermas imply some sense of equality, the content of the principle of equality in deliberative democracy remains open. Does equality mean equal allocation of talking time during a debate, or does it imply some minimal level of wealth (for one cannot argue on an empty stomach)? Second, it leads to the problem that people who are not capable of rational argument are excluded from deliberation and therefore democracy. In the case of children, or the criminally insane, this exclusion might be good, but rational argument also depends on some basic skills (minimally language and logic) which individuals need to acquire somehow. Some of the higher order skills (e.g. mutual respect, consideration of empirical evidence, etc.) can be transmitted from those who possess them to others. This thesis deals with those sort of skills and how ICT can be used in the nurturing them. But just as this thesis, limited to the context of an information society, demands that those concerned have at least basic ICT and Internet skills (otherwise they are not part of an information society), deliberative democracy demands that the deliberators have the basic skills for rational argument.

What constitutes a rational argument, and what to do about those who are incapable of it, is by no means a trivial matter, but the specifics are beyond the scope of this work. Nor is it my purpose here to address the problem of the so called digital divide, but if ICT is indeed relevant to politics, as I shall argue in the next chapter, then the problem of the digital divide can be seen in a different light. It is no longer sufficient to consider it in terms of have and have-nots, it has to be considered in terms of capabilities to affect one's own circumstances.

Provisionality

Because of reciprocity, deliberative democratic theories and practice are always under deliberative review. Since the theory implies substantive values, which ought to be the prerogative of the people, the principles of the theory itself, like all political decisions, are provisional. Deliberative democracy is not contrary to stable constitutions, nor does it imply that no final conclusions can be reached. What the provisionality of procedures and decisions means is that any statement should be open to retrospective review and alteration. If we take as an example the issue of gender equality, we can assume it to be largely settled. In western society discrimination on the basis of gender is unacceptable. This is a substantive principle which is tied to the procedural principle of equal right to participation in deliberation, and to the ontological issue of equality of being. Since the issue is settled there is no need to argue for gender equality every time anew. In the meantime genetic research is revealing more knowledge on the biological mechanisms of gender and technology is making sex-change procedures better and more available. If a group makes accusations of discrimination on the basis of dubious or altered gender, addressing such accusation might demand the re-opening of the debate on gender. Core arguments for non-discrimination might not be as strong if persons are being unacceptably excluded, so new policies and justifications would need to be found.

The provisionality of all the principles (with the exception of a notion of a rational argument) of deliberative theory itself sets it apart from other democratic theories. This introduces a flexibility which makes the theory applicable across a varied landscape of public values and

standards, whether the landscape varies over time or context (Gutmann & Thompson, 2004, pp. 95,114).

Mutual Respect

An important aspect of deliberative exercises such as the Deliberative Poll is the conscientiousness of participants. One must assume that individuals have the good-will to actually try and contribute, rather than disturb or distort the debate for their self-interest. Fishkin's work indicates that it is possible to cause the public to think about common problems from a point of view which is not purely one of self-interest (Fishkin, 2009b, pp. 119-128). Individuals do not invariably act selfishly, seeking short term personal gain from any political situation. Once the opposing point of view comes to be understood, even if still in opposition, individuals have the capacity to review their position in favour of a common solution. At the same time, a fair common solution will be understood as more desirable.

Such good-will and conscientiousness can be considered an outcome of the virtue of mutual respect amongst deliberators. Mutual respect is presented by Gutmann and Thompson (2004, pp. 79-90) in the context of a principle of accommodation. This principle demands that one is willing to accept, on the grounds of reason, arguments against one's own position. Nevertheless mutual respect is a virtue and as such it is something that is more like an aptitude, something one has the feel for, than a procedural requirement. Some level of mutual respect is prerequisite to deliberation, even if the practice of deliberation itself engenders this virtue in participants.

Public

Deliberation also has to be public. Public here is meant in James Bohman's (2004) sense of 'publicity of communication' where "Communication is 'public' ... if it is directed at an indefinite audience with the expectation of a response." (Bohman, 2004, p. 134) The reciprocity principle of deliberative rationality is not merely a demand for tit-for-tat, query/response two-way exchange, but a presupposition that claims are publicly scrutinisable and carry an accompanying expectation of a response. This sort of 'indefinite audience' with an expectation of a response is practically approximated in Linus Torvalds' attitude towards publication and licensing of his source code.²⁴ His point of view can be considered representative of the Linux community.

Democratic deliberation can also be considered to have a publicity requirement in the sense of implying interaction with a public sphere. The concept of 'public sphere' is best known in the form expressed by Habermas as the sphere of activity that is not private, but neither part of the state. More precisely, Habermas (1989) describes the public sphere as "first of all a realm of our social life in which something approaching public opinion can be formed. Access is guaranteed to all citizens. A portion of the public sphere comes into being in every conversation in which private individuals assemble to form a public body" (Habermas, 1989, p. 136). Because deliberative practice is aimed at directing action on the basis of public

²⁴ Torvalds' humorous comment during an interview about software licences captures this spirit succinctly: "For example, the GPLv2 in no way limits your use of the software. If you're a mad scientist, you can use GPLv2'd software for your evil plans to take over the world ("Sharks with lasers on their heads!!"), and the GPLv2 just says that you have to give source code back. And that's OK by me. I like sharks with lasers. I just want the mad scientists of the world to pay me back in kind. I made source code available to them, they have to make their changes to it available to me. After that, they can fry me with their shark-mounted lasers all they want." (Lyons, 2006)

opinion any such exercise engages, if not embodies, some aspect of the public sphere. The public sphere comprises such entities as the free press, activist associations such as environmental groups, other parts of civil society, and also any groupings which are only informally political. Any group which through its actions or positions demands a certain political milieu has a space in the public sphere (cf. Dryzek, 2002, chap. 1).

The most significant consequence of a notion of democracy that embeds interaction with the public sphere at its core is that the location of democratic practice is diffuse and widespread beyond the confines of the official institutions of politics and state (Dryzek, 2002, pp. 170-171). Deliberative democracy is not public in the sense that it is an affair of the state in contrast to a private action. It is public in the sense that, as democracy, it deals with common action of a public, and as communicative action it is publicly scrutinisable by all concerned.

The Relevance of Deliberative Democracy to Cyberspace

Before proceeding any further it is worth asking why one should care about democracy and cyberspace. Three reasons stand out: first, Lawrence Lessig (2006) has convincingly dispelled the anarcho-utopian vision of the Internet free from regulation. The liberating essence of the Internet was, and still is, held especially dear by those who have faith in the progress of technology. In fact cyberspace, as well as the physical and technical infrastructure through which it exists, demand governance of some kind or other. For the Internet to work there needs to be policy and technical coordination over the methods of information exchange. Governance at the level of protocols and assigned names and numbers has been in practice since the beginnings of the Internet. As the Internet keeps growing, its technical architecture keeps evolving. The design and administration of this architecture is a primary concern for Internet governance (DeNardis, 2010). The shape and form this governance will evolve into is not pre-determined because several actors (states, corporations, user groups, etc.) with a stake in Internet technologies have differing perspectives on what constitutes good governance. It follows that any proponent of democracy would favour development towards democratic governance over and within cyberspace.

Under liberal or classical democratic theory, rules of governance, laws, etc. can be *about* the Internet. Rules that are democratically enacted on how to act in cyberspace can be imposed from outside that sphere. Cyberspace can be imagined as a semi-autonomous colony, an external jurisdiction, an alternative arena for inter-subjectivity with a different set of limitations and potentialities of communication than afforded by physical presence—what could be called an ‘outer space’. By claiming that cyberspace is an outer space I am not making an ontological claim. I am only asserting that such a conception provides clearer understanding of what those whose actions (by means of communication) give substance to this entity experience in their engagement with the technology. The fact that the physical technology (servers, cables, electrons even) that allow cyberspace to exist in the first place are indeed grounded as things with physical extension and are located within nation states is not to be ignored. Still, while it may indeed be a social construct, common discourse and user experience presents cyberspace as a metaphorical unified place (Zuckerman, 2010).

Besides being congruent with the perceptions of those governed there is another reason for considering cyberspace as some sort of special place when investigating democratic

governance of this space. The architecture of the Internet challenges some of the basic assumptions of democracy in a fashion not dissimilar to the way other outer spaces challenge them. International agreements such as those dealing with the high seas, the Moon and Antarctica all face the challenge of who can lay claim to which part of that space. None of these spaces can have any sort of native citizens, and all face the issue of who is to, and how to, ensure (coerce) adherence to established principles of use for that space. In fact, international treaties about outer space, the high seas or Antarctica could serve as a model for cyberspace governance (cf. Dryzek, 1994, pp. 90-108).

The most notable difference between other outer spaces and cyberspace is that in the case of e.g. the Moon, it is its physical location (and the associated technical difficulty in being there) that challenges the standard conceptions. On the other hand, the tradition of diplomatic immunity for embassies provides a precedent to physical spaces within the practical reach of a nation state which are not subject to the same form of governance of their physical surroundings. What cyberspace shares in common with other outer spaces is a potential for providing universal human good, as a kind of Common Heritage of Mankind.

Considering cyberspace piecemeal, based on the physical location of the technologies that make it possible, rather than as a unified communicative space based on the actions which give it meaning, would be counter-intuitive to the governed and restrictive upon its potential. For one thing, the possibility of exporting democratic features of such a space to other areas would be lost.

Within a deliberative conception of democracy participation (or at least the possibility of participation) of affected communities is critical. If justifications are to be deemed rational they need to be provided in a language that is comprehensible, and provided within the relevant public context. Deliberative democratic practice about cyberspace needs to be held also online. Dryzek (1994) argues that international accords of a global scope benefit from discursive approaches. This is because of the discursive rationality's ability to deal with differing normative frameworks of participants. If democratic governance is desirable for cyberspace, the same arguments for why deliberative approaches should be preferred in complex cases hold for the case of cyberspace.

The second of the three reasons for caring about cyberspace and democracy is that deliberation requires participants to be well informed about, and have good-will towards, the issue at hand. The use of ICT for spreading information is well-understood. On the other-hand, cultivating the virtue of good citizenry, a propensity to rational debate and an awareness of the process with its demands for justification, explication, and review, is much more demanding. Gutmann and Thompson explicitly recommend formal education for the skills pre-requisite to deliberation (Gutmann & Thompson, 2004, pp. 35-36). Rather than take this to imply that eDemocracy programmes should have an eLearning component it is worth considering what Verbeek (2009) calls the amodern perspective of technology and its implications for cultivating the virtue of civic or active political life.

The amodern point of view goes beyond the co-construction of technology to assert that, not only does technology gain meaning from use, but that human values and norms are shaped by the use of technology. Verbeek's (2005) recurrent example of how ultrasound technology changes peoples conception of the unborn and thus moral positions on the rights of the unborn is typical. Deliberation itself, even mere discussion mediated through democratized technologies of communication, might be the best teacher of good democratic citizenship.

The third and last reason deliberative democracy and cyberspace are intertwined in a way that deserves our attention is because proponents of democracy are interested in spreading and deepening the relevance of democracy far and wide. The efforts by the EU at promoting eDemocracy as a way of getting more and more citizens involved are telling (Lucarini et al., 2009). Globalisation implies that political decisions on diverse political scenarios across the globe are ever more interdependent. The use of the Internet to spread democracy around the globe almost seems like a natural progression. More importantly, in established democracies of the western world ICTs are already ubiquitous. Whether explicitly sought or not, moral values and political preference is expressed by citizens through the mediation of ICTs. Recent news about the Norwegian Prime Minister running his country off an iPad is poignant. (Barnett, 2010). Therefore, the democratic (or anti-democratic) value of ICTs cannot be ignored.

To recapitulate, we need a conception of democracy that works in cyberspace for at least three reasons: 1) cyberspace needs governance, and we want it governed democratically, 2) ICT can teach democratic virtues, especially if the technology reflects these virtues and the learning happens through use, and 3) if we want to spread democracy, making sure that the most widespread technologies reflect democratic values would surely help.

That the use of such technologies reflects democratic values is essential if the use of technology is not to subvert democratic order by the inverse effects of those outlined above. Some critics of cyber democracy already bemoan the loss of the public sphere due to technology. Cass Sunstein's (2008) is essentially echoing Habermas' (2006 Footnote 3) concerns. These concerns reflect a fear that technologisation of communication is submitting human communication to a non-democratic order.²⁵ If the Internet divides and isolates governance will require external hierarchical supervision and the values that will be taught and spread through the use of ICT will be of self-interested individualism. A recipe for disaster in deliberative terms.

I contend that such concerns are overrated and arise out of an underestimation of the role individuals play in the workings of communications technology. The divisiveness of communities online is a reflection of current social trends and do not arise inherently from the structure of the networks and technologies underlying cyberspace. It is therefore still conceivable for the sort of communication demanded by deliberation to occur in a mediated fashion. Adam Briggie (2008) provides a strong argument as to why true online-only friendship is possible. Considering that friendship also depends on inter-personal communication, there is no reason to assume that the structure of the internet ought to impede the kind of communication necessary for deliberation. Moreover, Briggie argues that the slower, text-based, nature of online friendship relationships carries some advantages (besides disadvantages) to better express oneself. These advantages could also be afforded to deliberation. Laws, decisions, rulings, etc. typically take a formal written form. Written deliberation could hold the potential of being more accurately reflected in the 'final text' of a common action.

²⁵ This is a form of colonization of the lifeworld. Colonization of the lifeworld is when concepts, values and modes of thought associated with the market, management, law, science, etc. intrude into daily life to such an extent that individuals become unable to think—or act—outside those systems. Everything gets expressed in those system's terms—that is, everything is assigned a price, or a scientific truth value. This impoverishes our world and our relationships, by reducing the words, images and gestures of our communication to number systems, taxonomies, and rankings. Allusion, metaphor, and symbolism of daily experience are traded off for efficiency and precision, as defined by those very systems (Edgar, 2004, p. 239).

Another reason for holding that the underlying technology of cyberspace is not, by its very nature, an impediment to democratic practice is Feenberg's arguments for the democratization of technology in general. If, as Feenberg (2001) argues, technology is indeed democratizable, and the structure of cyberspace is not set in stone, but is in constant evolution (Lessig, 2006), then it is possible to steer emerging online technologies towards a democratic structure. If any part of cyberspace is democratized, then the underlying technical structures can be, through democratic choice, designed (or re-implemented) to afford better possibilities for deliberation and even facilitate, rather than impede, the flourishing of a public sphere. If communication in cyberspace is sufficient for proper friendship, and if any part of cyberspace is minimally democratic, then it is not the structure of technology itself, but the use it is put to by individuals and institutions that determines its potential for democratic practice.

Difficulties of Transposition

The claim thus far is that if the democratization of ICTs is desirable and the Internet is to be exploited for its potential for expanding democracy a conception of democracy which is not tied to an instrumentalist rationality is most adequate. So democracy in cyberspace ought to be conceived of, primarily, as deliberative democracy.

This task is not very straightforward. The principles of deliberative democracy make it necessary that democracy itself be justifiable and therefore inherently meaningful to those it affects. Some of the assumptions or implications of most descriptions of deliberative democracy (e.g. the description given by O'Flynn, 2006) would have their meaning radically altered in an online context.

The three elements of descriptions of democracy most problematic for cyberspace are residual vestiges of instrumentalist democratic theory. These are Citizenry, Borders and Establishment, which I will discuss in order below. Reference to these aspects is essential for proponents of deliberative democracy as an alternative manner of problem solving. If the aim is to address the limitations of liberal democracy, majoritarian rule, or other systems of government, reference to the constituent parts of that system is inevitable. Conversely, when democracy is interpreted discursively for non-physical space these three concepts become stumbling blocks to understanding. The difficulties which the notions of Citizenry, Borders and Establishment raise for thinking of cyberspace as a unified outer space need to be cleared before the claim that democracy in cyberspace ought to be conceived as deliberative can be put forward strongly.

Citizen vs. Netizen

The first concept that complicates transposition of deliberative democracy to cyberspace is the concept of citizen. Most discussions of democracy are concerned with citizens. "[O]ne may define citizenship as a collection of rights and obligations which give individuals a formal legal identity; these legal rights and obligations have been put together historically as sets of social institutions such as the jury system, parliaments and welfare states." (Turner, 1997, p. 5). Citizens are citizens of a nation state or some other discernible and bounded entity. Citizens democratically determine a course of action to be executed on their behalf. The status of 'citizen' is determined by law, and it is such citizens that have a right to participate in the deliberative exercise. It is all the citizens who must be represented in deliberation. While the rules of qualifying as a citizen can, and do, come under the lens of deliberative democratic

scrutiny, citizenry is a right that determines a person's status independent of his/her behaviour as a citizen. One can debate whether birth right to being a citizen of a country is justified, or if people residing in a country as refugees are to be considered citizens or not. In any case, once the rules are in place, those who are citizens remain so regardless of what role they play within the state.

Cyberspace has no such citizens. It only has netizens, and netizens are different. A netizen is one who 'digs the net'. Such a definition is only meaningful to netizens themselves. The concept of 'dig' is an internet meme that has to be appreciated through practice. It makes little sense in an offline context.²⁶ Turner (2002) presents cosmopolitan virtue as an alternative grounding to the notion of citizenship in response to the problems of classical definitions of citizenship in the context of global politics and universal human rights:

Cosmopolitan virtue may be regarded as a weak alternative to a strong theory of cultural relativism. A more important auxiliary argument concerns human frailty and vulnerability. The underlying moral component of this argument is that human frailty provides a foundation for recognizing a common human bond, typically described as 'the human condition'. Human beings are embodied, and therefore they are frail and vulnerable. In order to respond to that frailty, human beings create institutions to protect them against risk, but these very institutions are also sociologically precarious, Human beings need both social and ontological security, and therefore they need a 'sacred canopy' (Berger, 1967), but this sacred canopy can only have force if it is based on an existing foundation of social reciprocity.

(Turner, 2002, p. 59)

One can become a French citizen by being born in France to French parents, but that says nothing about that person's inclination and capacity of being a French citizen. On the other-hand no one is ever born online. It is one's capacity and inclination to partake in the institutions of cyberspace that determines their status as a netizen. Netizenship, like Taylor's understanding of patriotism in terms of cosmopolitan virtue, is not an all or nothing status. Different people can attain it at differing levels. This is because being a netizen is tightly knit to the capacity and skill of fulfilling that role. The observation that "The geography of emotions therefore appears to be important in creating civic loyalties and commitments. Political attachments need memories and collective memories need a location where these common rituals can be enacted. A placeless cosmopolitanism would also be vacuous and ultimately lifeless." (Turner, 1997, p. 5) does not weaken the applicability of this theory to netizenship, but reinforces the argument that cyberspace is indeed better conceived of as a 'space' of its own right, rather than as a set of interconnected machines.

Some of the most inspiring examples of deliberative practice address exactly issues where the 'constituency' is difficult to determine under existing norms of citizenship. Whether it is

²⁶ The verb 'dig' is generally defined as 'to understand an/or appreciate', but in use it has a deeper meaning. To dig something means to have a good understanding which arises from experiential knowledge of that thing. It also usually has connotations of positive bias based on that understanding. So if "I dig YouTube" it means that I like YouTube, because I understand how it works (either its social dynamic or its technical functions or both), and I understand how it works because I use it. One could use this definition to say that good citizens dig democracy, but such a claim would only be comprehensible to netizens who have experiential knowledge of this sense of the term 'dig'.

ethnic disputes in Australia, cross border resource management across Canada and the USA or peace and reconciliation in South Africa, deliberative democracy seems to succeed better than its alternatives where identity is at stake (Dryzek, 2005). This is because even if most descriptions of deliberative democracy rely on a classical description of citizenship it is not fundamentally tied to the core ideas of a discursive-rationality.

Deliberative democracy requires that action is justified in a reciprocal manner. This means that any and all voices that can contribute should be heard and taken into account. The problem of discussion with an entire population leads Fishkin to propose scientific sampling to provide a surrogate public that is still justifiably representative. But deliberative democracy requires *only* those who can contribute be admitted to the deliberation. Thus an overlapping network of mini-publics and issue specific fora can still meet the criteria of deliberation without running into the problem of having to listen to every single voice online. Dryzek provides a conception of deliberative democracy that can be decoupled from citizenry as it does not depend entirely on face-to-face debate directed at specific problems as an implementation of deliberative democracy. The netizen as deliberator is better conceived of in terms of Taylor's version of cosmopolitanism, which in turn also depends on mutual respect and reciprocity.

Borders vs. Virality

The second of the three problematic concepts in transposing deliberative democracy to cyberspace is the idea of borders, or more properly, of the sphere of authority of a democracy. Even cross border deliberation sometimes defines itself in contrast to the very borders that it straddles. There is an implicit linking of the physical proximity of actors and their relevance to a subject of deliberation. "Yet territoriality, though historically essential to the evolution of democratic representation, identifies only one set of ways in which individuals are involved in, or affected by, collective structures and decisions. Issues such as migration, global trade, and environment, for example, are extraterritorial; they are not contained by any existing territorially organized polity" (Urbinati & Warren, 2008, pp. 389-390). In, for example, a debate about building a nuclear power plant those who live in proximity of the site are always considered relevant actors. NGOs deploying alternative energy on the other side of the world, locally in some under developed region, are typically not considered relevant. In a globalised world this issue is compounded by problems like climate change, which seem to involve the entire world population as relevant stakeholders.

"Other issues are nonterritorial, particularly those involving identity, such as religion, ethnicity, nationalism, professional identity, recreation, gender identity, and many social movements. Such nonterritorial interests are not new to democratic theorists" (Urbinati & Warren, 2008, p. 390). In cyberspace the problem is not merely one of global scope, but primarily one in which physical proximity and deliberative competence and relevance become decoupled. People with a shared interest online might have completely different social backgrounds in their physical lives, and probably differing moral values too. To rephrase Peter Steiner's quip "On the Internet, nobody knows you're a dog" (Fleishman, 2000). In cyberspace one's activity through communication define one's identity at least as strongly as one's physical circumstances.

The problem is one of determining the constituency of a debating public. An increasing number of spatially distributed groupings are involved in collective action, and need to take collective decisions. In western societies, technologies and markets keep pushing the

diversification of modes of community formation and creating novel forms of shared identities. “As a consequence of these developments, the standard account has been stretched to the breaking point. Among the most fundamental of problems, ironically, is the very element that ushered in democratic representation—residency-based electoral representation. The claim of any state to represent its citizens—its claim to sovereignty on behalf of the people—is contestable, not because states do not encompass peoples, but because collective issues only partially admit of this kind of constituency definition.” (Urbinati & Warren, 2008, p. 390). Classification on the basis of residence, race, bodily capacity, economic standing, etc. are almost meaningless for inter-cyberspace issues.

Deliberative democratic choices are to be binding because the participants accept them as such. Therefore virality and its empirical analysis might provide a better avenue for developing criteria by which to determine the extents of governance practice in cyberspace. Virality refers to the phenomenon whereby bits of information or cultural trends spread across cyberspace like an epidemic, with individuals recommending content ‘consumption’ to peers, who then further spread the content. Recent empirical research into virality (J. A. Berger & Milkman, n.d.; L. Berger, 2009; Stephen & J. A. Berger, 2009; Stephen, Dover, & Goldenberg, 2010), even if aimed at producing models useful for viral marketing strategies, reveals interesting aspects for democracy. Viral spread online seems to depend on a level of reciprocity on part of the participants. Additionally, user’s levels of activity and involvement seems to be just as important as their number of connections or popularity. These early studies focus on the psychological factors which aid spread. They reveal, for example, that in online newspapers “[p]ositive content is more viral (than negative content), as is content that inspires awe. But while sad content is less viral, anger or anxiety inducing articles are both more likely to make the paper’s most emailed list.” (J. A. Berger & Milkman, 2009, p. 2)

How such insights might inform an alternative conception of the sphere of influence of a democracy, particularly in relation to coercion, cannot be predicted at this point. It suffices to highlight that when democracy is understood as an activity based on deliberation 1) territorially based demarcations of governability are inadequate, and 2) alternate conceptions are possible. Demarcations of constituencies could be based on the action through communication of individuals rather than their physical genesis.

Establishment

The third, and last, complexity of transposing notions of deliberative democracy to cyberspace is that of theories assuming the presence of an ‘establishment’ or a ‘system’ to execute the will of the people. The departments of a state are given set instructions to follow instrumentally in order to realise the democratically chosen path of action. Some scholars hold that deliberative practice ought to extend beyond the traditional role of relaying the choice of the people to corporations, civil society and government executives. The lack of an institutional framework for the whole of cyberspace echoes the problems of implementing the dictates of multi-national agreements.

Once more, the dependence on some overseer for transforming the democratic decision into action is a condition of an instrumental rationality. Instrumental actions of individuals towards a single goal need not necessarily be directed instrumentally and thus hierarchically. Even within liberal conceptions of the state, laws have been shown to have substantial expressive functionality (Sunstein, 1995). This means that the prescription for action or collective will expressed in the text of a law is sometimes as important to the desired outcome as the physical

actions demanded by those laws themselves. Those cases in which a decision is accepted as rationally justified, that justification becomes as strong as, if not more than, the threat of coercion to ensure compliance.

On the Discursive Nature of Cyberspace

The three problems for transposing deliberative democratic theory to cyberspace described above can all be linked to the challenge of practically implementing the principles of deliberative democracy as real world practice in every day life. The obstacles presented above are, after all, practical issues. That a problem is practical rather than conceptual does not make it any less serious. The practical impossibility of having a civil discussion when a large number of people are involved is a real challenge to deliberative theory. But this sort of problem is context dependant. Pan-European deliberation requires instantaneous interpreters to help. Deliberation in an under-developed small state might not face the problems of language, but might instead have to contend with illiteracy when providing information.

None of these issues is necessarily tied to the core principles of the theory. By stepping back from the world of practice and considering deliberative theory in a more abstract manner, cyberspace will be revealed to be, in certain respects, more commensurable with the demands of deliberative democracy than the limitations of the physical world would allow in real-space.

John S. Dryzek's (1994) account of discursive democracy is abstract enough to allow enough room for interpretation so as not to depend on concepts which ill-fit the practical realities and/or widespread understanding of cyberspace. Dryzek bases his theory, building on Habermas' theories but going beyond them, on the idea of discursive rationality. He then provides a solid critique of the possibilities of instrumental rationality for problem solving under conditions of complexity. Dealing with complex public issues, therefore, is better served with the alternative discursive rationality. The kind of democracy that is based on discursive rationality is discursive democracy.²⁷

When interpreted in a discursive mode, deliberative democracy does not just provide "a set of principles that are intended to establish fair terms of political cooperation in a democratic society" (Gutmann & Thompson, 2002, p. 95), but additionally "[d]iscursive action facilitates the provision of public goods in a decentralised and noncoercive manner, ... An additional attraction of public supply through discourse is that this procedure enhances subsequent compliance with any agreements reached simply because the parties involved will have freely consented to the content of the accords ... Moreover, discourse can also define the very content of public goods through ..." (Dryzek, 1994, p. 55).

It is this second aspect of discursive action that best adapts itself to cyberspace, because of cyberspace's very nature as an informational entity. The nature of cyberspace is such that all its resources are informational (servers and physical equipment simply provide the conditions of possibility for cyberspace itself). The meaning of information is obtainable only through linguistic inter-subjectivity.

²⁷ Dryzek has used the term 'discursive democracy' in presenting his theory of deliberative democracy. For the current purposes 'discursive democracy' and 'deliberative democracy' can be considered equivalent. 'discursive democracy' is used only in reference to Dryzek's work.

Knops (2006) argues for a re-focusing of the core of deliberative democracy towards explicitness in language rather than justification, if the emancipatory potential of the theory is to be achieved. Knops, like Sunstein, explores the productive power of statements. Deliberation, as an activity, generates the necessary justifications for rationally grounded action. Deliberation is not just for choosing amongst, but a vehicle for creating paths of action that are acceptable. In the context of cyberspace, Knops' argument supports a stronger focus on productive force of deliberation stated above. Just as rational judgements and public goods come to be out of individual's expressions through the practice of deliberation, individual's expressions (in digital form) become digital goods valuable to the community through communication and exchange in cyberspace.

Conclusion

In view of the above considerations the following can be put forward as an interpretation of deliberative democracy that is applicable in cyberspace: In cyberspace deliberative democracy is discursive action that provides (or generates) public informational goods in a decentralised and non-coercive manner. Public supply through discourse enhances subsequent usability of goods simply because the parties involved will have freely contributed to the content of those goods. The very content of public informational goods is defined through discourse. The gamut of these goods define the public region of cyberspace and determine the fair terms of cooperation online.

I have tried to address the question "what would democracy mean in cyberspace?" Descriptions and theories of democracy typically assume several things to be the case. Citizens of some nation state are the default subjects of democracy. Governments, of various shapes and forms, must act according to the democratic will of citizens. In cyberspace there are no citizens and the layout of cyberspace on the Internet is in significant conflict with the geospatial arrangement, if not the nature, of nation states.

If cyberspace is to provide the milieu within which an understanding of democratic life that address its current problems is to be found, it would be sensible to start with a conception of democracy that is meaningful *within* cyberspace itself. Theories of deliberative democracy are possibly the only conceptions that are flexible enough to sustain the loss of reference to citizens and governments while still keeping a common core conception of democracy. After a brief description of what deliberative democracy is, I have enquired into why deliberative democracy is relevant to cyberspace. Next I looked at some of the problems transposing theories of deliberative democracy to cyberspace might face and how they might be overcome. Finally, I have proposed what democracy for cybernauts could mean, based on the foundations of deliberative theories. With such a conception of deliberative democracy cyberspace can be understood as a milieu-upon-which rather than an instrument-with-which democracy itself can be enhanced.

— 3 —

Technology Democratising its Users

Democracy places a burden on its beneficiaries. At a minimum, as in most contemporary democracies, it requires citizens to vote every so often to choose their leaders. Moreover, good democracy requires that voting is not done on a whim, but thoughtfully and upon reflection. Deliberative democracy carries even greater expectations. The people ought to engage in deliberation. Participants must be reasonable, rational and raise counter points for discussion. To be able to do this they require specific skills and capacities like the ability to communicate, the time to do so and also a certain will to democracy.

The same applies for sports. To play football well one needs skills and capacities like the physical strength to run, the skill for kicking a ball accurately but also a certain will to win. By the will to win I mean a willingness and desire to go through what needs to be done to win (the hours of training, finding the time, accepting failure, etc.). The virtue of sportsmanship is not expressed only by a person's record of victories, but also by one's approach to the sport, one's attitude to life or general character traits, which contribute (sometimes incidentally) to achieving one's goals.

Similarly, civic virtue does not stop at the ritual performance of electoral duties (cf. Keating, 1964) because common will "is not given from the beginning and 'discovered', but is formed in a process of deliberation and negotiation where new perspectives may be taken into account, new information added, preferences changed, and so on" (Jacobsson, 1997, p. 70). Civic virtue, then, must include what I shall call a will to democracy: the desire to be part of a process of collective will formation, even when the process of will formation itself, and not just the implementation of that will, requires effort. The will to democracy implies a character with "a disposition not to make a partisan judgement, but an independent judgement about the public interest" (Fishkin, 2009a).

Technology can be used to help improve the skills and capacities of a sports-person. The set of technologies known as the gym can improve, through use, the strength and stamina of a footballer. It is not only by playing football that the player improves their game. Moreover, gym technology does not improve the game of the footballer by acting upon him/her. It is by the player's action upon the technology that his/her game improves. ICTs appear to hold similar promise for democracy. eDemocracy and eLearning can improve the democratic participant's skills and capacities—his/her democratic game. In their most popular present implementations eDemocracy and eLearning try to do this by acting upon the citizen. Portals provide information and means of reaching authorities, as well as teaching literacy and reasoning skills (i.e. formal education). This raises the question: can ICTs improve the democratic game by being acted upon, when users generate content and teach, rather than consume and learn? The analogy of the gym suggests this might be the case.

The inspirational work of Sugata Mitra, in the slums of India, empirically demonstrates how the use of ICT can improve various skills in children with minimal intervention from educators. Mitra and his collaborators have been conducting research on the learning that goes on around Hole-in-the-wall computers (Dangwal & Kapur, 2009b). The Hole-in-the-wall projects involve PCs embedded into brick walls (hence the name) in public spaces frequented by underprivileged children in very poor neighbourhoods. The PCs are provided with an Internet connection and a track-pad or other basic input devices. No instruction is given to the children on the use of the PC. Mitra and his collaborators' observations of the children's behaviour around these PCs provides substantial evidence of children's capacity to self-organise into social networks and self-learn basic ICT skills with no, or minimal, supervision.

The children use various ‘learning by doing’ methods (Dangwal & Kapur, 2009b). Anecdotal evidence also indicates that the children’s behaviour changes in a positive manner when they use the Hole-in-the-wall. A pilot study to examine how the values of children change when exposed to the Hole-in-the-wall provides empirical support to the notion that the use of ICTs does indeed affect values. Additionally, the study indicates that the social interaction occurring around the technology is an important aspect of how the changes occur (Dangwal & Kapur, 2009a).

The Hole-in-the-wall studies do not measure ‘civic virtue’ as one of the values being affected by ICT, but it is difficult to imagine how, for example, a serious and respected blogger who writes about some political issue is not exercising his/her civic virtue.²⁸ At the same time, political bloggers can also engage in character assassination and personal attacks on political figures. Just as someone can hurt themselves in the gym by using inadequate equipment, or using good equipment badly, ICT use can either promote or inhibit democratic skills. Given the choice of ICTs available, are some kinds of ICTs more capable than others at promoting civic virtue through use?

The conception of deliberative democracy I presented in the previous chapter is a useful tool for classifying ICTs upon their potential to enhance democratic capacities through use—by being acted upon. The question being addressed in this chapter is whether technologies can, through use, affect the moral requirements of common activity, such as the will to play good football, or to sustain good democracy. First I will address the question of technology shifting our morals generally, then specifically for ICT and democracy.

To begin, I will argue that technology is not morally neutral. Scholars have shown that technologies do interact with our morals in guiding our actions. Having opened the possibility for interaction, I will briefly present Verbeek’s notion of mediation. According to Verbeek, technologies do, through their use, modulate the values each of us holds (Verbeek, 2008b). In the second part of this chapter I will focus on ICTs and democracy. This is based on what Feenberg would call a substantive view²⁹ of ICT. I will present Feenberg’s notion of technological subversion.³⁰ Put simply, technological subversion is when users of a technology adopt it in an alternative way to that intended by the designers, when a technology acquires a meaning different from any institutionalised prescription. For Feenberg (1999) no complex system can be all encompassing and beyond resistance. Feenberg’s subversion is not destructive but rather a means of democratization. It shares something with deliberation, such as a constant opposition to the *status quo*, wide and local participation, and the opening of possibilities for evaluation.

28 A clear example is British humorist Stephen Fry’s blog post on the 2010 British election. The introduction to his post is a self-reflexive analysis of his own position as a media personality and a blogger, and how his ‘blogging’ fits into the election process. Fry is most known for his witty humour, but is also known as an entertainment personality who was/is an early adopter of new ICT, and a gay rights activist (Fry, 2010).

29 “Substantive theory claims that what the very employment of technology does to humanity and nature is more consequential than its ostensible goals.” (Feenberg, 2002, p. 5)

30 In recent work Feenberg (Bakardjieva & Feenberg, 2002) has used the term ‘creative rationality’ in place of ‘subversive rationality’ to refer to the ideology behind his project for the democratization on technology. I prefer the term ‘subversion’ in the context of ICT as it fits well with the notion of ‘versions’ as evolutionary variations. This is a familiar concept in cyberspace with terms such as Web 2.0 and new versions of software appearing daily. The idea of creativity tends to imply that something comes out of nothing which is not the process I am exploring here. Still it is important to note that the meaning of the term subversion in this context has nothing to do with the kind of destructive insurgent action undertaken by political radicals which is sometimes referred to as subversive activity.

I will argue that digital technologies are amongst the most flexible and therefore the most open to subversion. To subvert a technical system the user needs 1) to work upon the system, not just within it, and 2) to cultivate a will to subvert i.e. a propensity to such activity as challenging the *status quo* (or demand its justification) and evaluating alternative paths with openness to others. These are among the characteristics that lead to good deliberative democratic practice.

In practice not all ICT is equally open to subversion, even if all function according to a ‘digital rationality’ of bits and algorithms. This is typically due to external factors such as laws, geography, physical possibility and technical skill. A question therefore arises as to which ICTs ought to be endorsed to seed the democratic subversion of cyberspace, thus developing democratic capabilities in the netizen-cum-citizen. The nature of MBDGs as described in the first chapter makes it clear that they readily open up to subversion. The next chapter will explore some MBDGs for their democratic and/or deliberative characteristics.

Interaction of Technology and Morals

In an instrumentalist world-view technologies are merely neutral tools which people use towards achieving their goals. A car is just a device to carry you from A to B, it has no morality. It is always a person who decides where and how fast to go: morality and choice are the domain of sentient beings, not technology. While it is true that moral agency is only attributable to free and autonomous entities, Science and Technology scholars have shown time and again how most technology is no trivial neutral implement (cf. Sismondo, 2009). An alternative conception of the moral agent is needed to take into account the role of technologies in morally directed action.

Technology is Not Neutral

The claim that “Artifacts have Politics” has been most notably argued for by Langdon Winner. Winner (1986, pp. 19-39) presents two ways in which technological artifacts are intertwined with politics, supporting his arguments with prototypical examples. His first example has become a classic of Science and Technology Studies cited in several textbooks. This relates the story of Robert Moses’ bridges in New York. In Winner’s version of the story, Robert Moses, the great architect and planner of New York City, built overpasses on the parkways so low that buses could not pass under them. The reason for this, Winner tells us, was that Moses was racist. By building low overpasses he prevented low income African-Americans, who depended on public transport, from reaching the long island beaches. These beautiful beaches would only be enjoyed by the affluent white classes who owned cars. All this thanks to a ploy by Moses, which appears to be an innocuous architectural choice.

This story is controversial because more recent research reveals that Winner might have been mistaken about some of the facts (Joerges, 1999). Moses, it turns out, was no more racially prejudiced than most of his contemporaries. Besides, there seems to have been other reasons why the overpasses were built so low, be they technical or aesthetic. As overpasses go, the ones Moses built are not extraordinarily low. Most significantly, there are other routes through which one can get to the beaches using public transport.

Although Winner’s story of Moses’ bridges turns out to be more of an urban legend than a bit of history, like any good mythology, the factuality of its statements does not detract from the point being made (Woolgar & Cooper, 1999). Physical objects can be engineered to embody a

moral position. One can impose, or at least promote, political aims through the use of technologies intended for other purposes. The architect may be gone, but his politics remain active through the things that still stand.

A possibly less controversial example relating to ICT would be Microsoft's bundling of its Internet Explorer web browser with its Windows operating system. While this packaging of technologies is supposed to make it easier, and safer, for consumers to use computers, the European Union found this practice to be anti-competitive and that it reduces consumer choice. While it is impossible to know the precise motivations of a corporation like Microsoft, past court cases make it reasonable to suspect that such practice is not a technical choice but rather a political one implemented in technology. The bundling of the web browser is likely intended to lock-in consumers to a specific technology, that sold by Microsoft, and push out competing technologies (European Commission, 2009).

Another of Winner's (1986, p. 26) examples, this time with unintended consequences, comes from California. When the mechanical tomato harvester was introduced its aim was to improve farm efficiency. The way it was to achieve this was by relieving manual labourers of the particularly arduous job of hand picking tomatoes. This mechanical innovation had various effects on the whole of tomato farming in California. Firstly the machine required substantial investments of both money and effort. It also only became efficient when used at substantially larger farms than the typical tomato farm of the time. This led to farm concentration, until finally there were only few very large tomato producers instead of many small ones. The second effect was due to the mechanical harvester's rough handling of the fruit. The mechanical harvester is not as delicate as human hands in collecting tomatoes, so it works more efficiently when the breed of tomato is the hardier, sturdier, but less tasty than the ones previously grown. The mechanical tomato harvester brought about a change in the variety of tomato types on the market, favouring ones that are less tasty.

A choice such as that between a few large farms and several small ones has obvious political implications. The choice between a tender juicy tomato and a not so tasty stiff one is not usually thought of as a technical choice. Yet technologies always have some unintended side effects. These effects are not just technical, they spill over into social and political life. By embracing particular technologies we reach far beyond the specific issue that a particular technology is aimed at. In such cases the features of the device itself are a convenient means for establishing or maintaining a specific normativity.

The second way in which technologies relate to politics, according to Winner, is when a technology demands particular kinds of social and material arrangements. Winner is here echoing Engels' position on how industrial production subordinates the will of individuals to make them compatible with production. Winner's argument is more subtle though. In Engels, the specific normativity of the labourer is an intrinsic feature of the technical system. Workers with the right work ethic are as critical to the factory as wheels are to a car. For Winner, a certain ethical milieu is more compatible with some technologies than others. He refers to the arguments made by promoters of solar energy who claim that distributed power production is more compatible with democratic values because it allows individuals and local communities to manage their affairs more directly. In this second kind of technology politics the features of the device are strongly, if not unavoidably, linked to particular social arrangements, institutions and implied morality (Winner, 1986, pp. 30-31).

Certain technologies, particularly large scale and complex ones like a nuclear reactor, can only be envisioned to operate safely if the operators conform to a particular way of thinking about social arrangements, namely the hierarchical structure of authority. For example it is very difficult to imagine a nuclear power plant being run in a democratic way. Moreover, we all want electricity and want to avoid a nuclear meltdown, so the presence of a nuclear power plant imposes upon us the acceptance of the authoritative, hierarchical way of running large technologies. Winner notes how a democracy loving people is willing to invest so much energy and resources into building and running such a despotic institution as a power plant, yet we accept it in the name of efficiency. Even large scale production and assembly lines, which can indeed be run as co-operatives or through worker management, have historically tended to be managed hierarchically, as this is generally seen as the most efficient means of achieving the plant's aims.

All of Winner's examples and arguments ultimately contribute to the same basic and critical observation. Basically, that even if "[b]laming the hardware appears even more foolish than blaming the victims when it comes to judging conditions of public life ... [t]here are, however, good reasons to believe that technology is politically significant in its own right." (Winner, 1986, pp. 20-21)

But in Winner's stories the technology is affecting people. The relationship is causal: the introduction of a technology brings about certain political effects; or the use of a technology is only possible after a certain moral change happens. People and machines are clearly distinct kinds of actors. To understand the mirror effect, i.e. how politics or morality are affected through the use of technology, we need to overcome the division between humans and devices. To explain why this distinction is to be overcome the sports analogy is again useful. While the observation that a technology can have a physical effect upon the body is a trivial one, the equivalent observation with respect to politics and morals has often been disregarded. Winner's stories show that technology does have effects, intended or not, upon morality. Winner's first set of examples (Moses' bridges and the tomato harvester) are analogous to the use of anabolic steroids or electro-stimulation of the muscles. The operator, say a doctor, uses the technology as an instrument upon an object, such as the muscles of a sports person. The person (as a body) is the object of the technology like tomatoes are for the harvester. The electro-stimulation machine obtains its effect by being used on its target, just as a bridge creates its effect by being placed in a particular place.

The second way in which technology affects humans (such as the nuclear reactor) is similar to a gym in the sense that people are affected by operating the technology for an ulterior motive. One conforms to a hierarchical social structure by working at a nuclear plant, with the aim of generating power. The gym is used to improve one's health and stamina, and this is achieved by operating the devices which merely provide resistance. This is not to say that a technology can only affect morality in one way or the other. Possibly any technology provides both kinds of influence, but the latter kind requires us to put devices on the same level as humans, as which is subject and which is object becomes a relative question. Is the gym acting on the human as the steroids are, or is the human operating the gym as he/she would a hammer?

The champion for the removal of the human vs. non-human distinction is Bruno Latour. According to Latour (1992, 1994, 1996, 1999), in order to fully grasp the moral landscape of modern society, humans and non-humans need to be considered symmetrically when analysing technology for its social import. It is a network of 'actants' that exhibits morality, and the actants can be human and non-human. According to his Actor-Network Theory "the

prime mover of an action becomes a new, distributed, and nested series of practices whose sum might be made but only if we respect the *mediating* role of all the actants mobilized in the list” (Latour, 1994, p. 34 my emphasis). This does not mean that things are moral agents in and of themselves, but neither are humans. Human action is mediated through technology. By understanding what this mediation means, in terms of networks, we can address moral issues related to technology.

Latour describes four forms mediation can take: Translation, Composition, Reversible Black boxing, and Delegation.

Translation

By translation Latour means a displacement, a shift in the goals of a agent’s programme of action, because of the intervention, inclusion or recruitment, of another agent such as an artifact. His typical example of this involves the debate about carrying guns. The National Rifle Association (NRA) in the United States uses the slogan “Guns don’t kill people; people kill people” to counter act the gun control lobby’s claim that the widespread availability of firearms in the USA endangers people’s lives. For Latour both sides have it wrong. The program of action of a person who might be considering violence against a third party changes once that person recruits a gun to aid in those aims. A person who might be seeking vengeance on an other, who happens to be stronger than them, might on obtaining a gun realise that it is now possible for him/her to kill his opponent. The goal of vengeance becomes the goal of murder with the availability of a gun. Because of the symmetry of all agents, when the gun is handled by the vengeful individual its programme of action changes too. A hunting tool, kept as a family heirloom, might suddenly turn into an instrument of murder, when it is loaded and carried by a person intent on harming another. Latour claims that agents’ (be they human or artifact) programs of action are translated when multiple agents interact as a network.

Composition

The second, but closely related, manner in which technologies mediate is by combining with other agents to compose a new program. To continue with the example above, one could say that it is a “Gun-Man” who kills people. When agents recruit other agents to achieve parts of their program of action a new complex program emerges. It is a hybrid agent that acts in some particular fashion. Even if there is a prime mover for a particular action, we ought to recognise that it is only through a composition of multiple agents that certain action programs are obtainable.

Reversible black boxing

Black boxing refers to a “process that makes the joint production of actors and artifacts entirely opaque” (Latour, 1994, p. 36). When a joint production of actors and artifacts becomes so for granted that it falls into the background it is black boxed. There are many such black boxes all around us in our daily lives. Latour gives as an example a projector in a classroom. It is part of his program of action to deliver a lecture, but it normally seems to be composed of zero parts, merely fulfilling a specific function. But black boxing is reversible. If the projector breaks down it no longer stays in the background. When a technician opens the projector to fix it we are reminded of the myriad parts that make it up, and the various actors involved which allow it to fulfil its program of action. All the parts in the projector are also black boxed. When the technician replaces the light bulb of the projector it too is a black box, made of many parts, and involving many actors.

Delegation

Delegation is, for Latour, the most important facet of mediation. It occurs when a goal or function is ‘inscribed’ (or reified, materialised) in an artifact, which then takes on a different meaning. The humble speed bump provides a prime example. The aim of slowing down cars is translated by means of a speed bump from a moral decision aimed at safety to a selfish act of protecting the cars’ suspension. This is so at least for the driver. For the local authorities the result is that cars drive slowly. The moral aim of making roads safe is achieved by delegating the task of punishing fast drivers to the speed bump, rather than to a traffic warden. The message “drive slowly, or else!” is embedded in concrete. The message and the action concerned remain, even when the engineers who design the speed bump and the local authorities who commission it are gone e.g. in the middle of the night. This sort of mediation is only possible through a combination of the other forms. Latour invites us to “[t]hink of technology as congealed labour” (Latour, 1994, p. 40) When the prime mover, or moral agent is gone, the program of action remains, materialised in the artefact. These artifacts mediate the meaning of the world to any actor who encounters them.

Technological Mediation of Morals

Latour’s description of human-technology relationships is very powerful in overcoming the subject-object distinction. This means that technologies ought to be, under such description, subject to moral evaluation. The problem is that Latour’s position is so radical that little space for normativity remains. If morality rests with a network rather than single entities, the moral subject dissolves to nothing. In Latour the subject-object divide is overcome, but we are left with pure object and no subject (Dorrestijn, 2009).

Peter-Paul Verbeek’s conception of mediation offers a way out. Verbeek (2005) integrates Latour’s descriptive analysis of technology into a wider postphenomenological position. To do this he translates the vocabulary of Latour into that of Don Ihde’s postphenomenology. This approach tries to describe how *humans* experience and represent the world. This experience and representation mainly occurs through technologies. While Don Ihde’s ideas provide the hermeneutical aspect of Verbeek’s theory of mediation, allowing for the human to remain central to his analysis, Latour provides the existential aspect. But mediation for Verbeek has a slightly different meaning than for Latour. For Latour mediation occurs between actants in the network. For Verbeek mediation occurs between humans and the world. Technologies do not merely mediate their own meaning and action. They also mediate the way humans experience the world, and how they act upon it. This more nuanced position opens the possibility for meaningful ethical exploration of technology while still overcoming the ‘modern’ human-technology/subject-object divide.

Verbeek’s prototypical example, used as a guide throughout his work, is pre-natal ultrasound. He argues that ultrasound technology shapes and modulates the prospective parents’ conception of the foetus through mediation (Verbeek, 2008a). Ultrasound technology is not just the machine, the thing that the doctor uses. Rather it is to be understood in terms similar to those of Latour, as a set of interactions between various agents, some with moral agency (humans), some without (things), but all morally significant. Additionally, for Verbeek, mediation also includes the way in which a technology opens up possibilities for action and perception, which in turn, shape our world view.

The image on an ultrasound device presents the foetus as free floating, not connected to the mother, which creates an impression of it being already an independent entity. Images can be

taken home and placed in the family photo album before the baby is born, engendering attachment to the child to be. The wide involvement of medical staff turns pregnancy into a medical condition. The mere existence of the technology also puts a moral burden on parents. Ultrasound can be used to diagnose congenital defects in a foetus. If the foetus is suspected of having such defects further tests can be conducted, but these carry the risk of abortion. Should a congenital defect be confirmed, the parents are faced with the dilemma of whether to abort or not. The significant aspect of the moral weight of ultrasound technology is that even if parents were to refuse to have an ultrasound (or they might ask the doctor not to inform them of his/her conclusions) they would still be making a moral judgement. Should parents refuse to 'submit' to the technology, and happen to have a child with a disability, they might be judged as having been irresponsible parents. The possibilities for action opened up by a technology, independently of the actual use of the technological device itself, modify the moral landscape of society on the whole.

There remains a problem with using Verbeek's analysis of technology for ethical evaluation. When the mediatory role of a technology is taken into account, utilitarian or deontological moral theories can prove very tricky, if not impossible, to apply. The network nature of technology, combined with the black-boxing effect, implies that any utilitarian calculus becomes impossibly complex. A utilitarian calculus of a technology is only possible if the technology's black-box is kept shut and individual preferences averaged out. Additionally, any sort of technology assessment faces the Collingridge dilemma, "a methodological quandary in which efforts to control technology development face a double-bind problem: (1) an information problem: impacts cannot be easily predicted until the technology is extensively developed and widely used, and (2) a power problem: control or change is difficult when the technology has become entrenched" (Collingridge, 1980 in Tannert, Elvers, & Jandrig, 2007). This reduces a consequentialist evaluation of technology to speculation.³¹

A deontological approach also falls short of accounting for the moral force of technological mediation. Such an approach requires some fixed notion of human nature, a reference point that is immutable over time and context. But technologies change their meaning dependent on their context of use, and even mediate our perception of the world around us. Most significantly technologies mediate our conception of the self and put into doubt the coherence of the concept of 'human nature' as universal. If one cannot presume a fixed human nature upon which to anchor an ethical evaluation, typical deontological approaches to ethically evaluating technology become problematic. Take Verbeek's example of pre-natal ultrasound as a technology that is to be ethically evaluated. One could start from fundamental principles that are universally accepted such as "the right to life", life being a pre-condition to autonomous being. Mediation theory reveals that the conception and understanding of the foetus is itself modulated through the use, adoption, and even availability of ultrasound technology. If the very nature of that to which the property 'life' is attributable (i.e. what sort of life-form a foetus is) is disturbed by technology, then the very concept of life, and what it means to have a right to life, is affected by the technology under evaluation. Moreover, technology does not sit still until our conceptions clear up and attain universal status, but keeps on developing in a context set by the current moral landscape. This does not mean that the whole oeuvre of deontological theory can be summarily dismissed because of

³¹ Technology assessment is still indeed possible, but a strictly utilitarian calculus is an inadequate method. Arie Rip, while rejecting the simple version of the Collingridge dilemma, has proposed methods for assessing technology in the presence of uncertainty which cannot be entirely eliminated. See (Rip, 2002; Rip & Kemp, 1998; Rip & Schot, 2002).

technological mediation, but only that alternative approaches to ethics might prove more adequate in the context of inquiry upon technology.

An alternative approach that is better able to deal with the dynamic fluidity of human being's technologically mediated everyday life (our amodern hybrid condition), even if lacking the rigour and logical certainty of classical approaches, would be, at the pragmatic level, more illuminating on which paths of action individuals or communities are to embark on. In his more recent work Verbeek starts exploring the possibility of applying Foucault's approach to ethics to technology. This approach is based on the notion of 'technologies of the self' or how humans act upon the world to shape themselves. Foucault's ideas are inspired by ancient Greek ethics. 'Ethics was not primarily about showing morally right behaviour; its main focus was not the question of "how should I act?" but "what kind of subject do I want to be?". Ethics was a matter of "care of the self": paying careful attention to one's subjectivity, and shaping one's life in a desirable way.' (Verbeek, 2008b, p. 91). Within such a framework, the ethical evaluation of a technology would have to take the shape of an exploration of how the technology imposes, inhibits, or enables, the formation of the self through mediation. For a political evaluation, the analysis would also explore the relationship the technology has with the community or group which is to undertake common action.

Let us consider again the sports person and the gym relationship in this context. One might be interested in football but not have the time for it. The widespread availability of gym equipment, 24 hours a day, even in the home, substantially weakens the 'no time' excuse. Engaging in physical exercise becomes more of a personal choice. By pitting oneself against a machine that provides a constant opposition (numbered weights, etc.) one's self-understanding as a sportsman can be evaluated in a different fashion than on the field. After all, in football it is few who score goals. Gym technology can also be understood as a social technology. By committing oneself to spend an hour a few times a week in a common space with others aiming at a similar goal in a pleasant environment (consider modern gyms with such amenities as fruit bars and personal trainers) both one's body, and one's self expectation are modified in such a way that it will be easier for the individual to commit to a team and play for 90 minutes. If the team uses the gym together, the strengths, weaknesses and the will to win of the team as a whole will be similarly mediated.

ICT and Democratic Values

Having shown that technology is very much morally and politically significant, I will now turn to ICT as a specific technology and its relationship to democracy. Digital technologies are potentially more radical than most other technologies when viewed in terms of Andrew Feenberg's notion of subversion. By drawing parallels between the underlying principles of Feenberg's theory of subversion and those of deliberative democracy as described in the previous chapter, I will show that the use of certain ICTs and the practice of deliberative democracy are intertwined. Where individuals and groups practice both (living in cyberspace and in a democracy) technology and politics co-constitute one another.

Subversion

Every technology carries the potential for unplanned uses. And the more flexible, widespread and diversified the use of a technology is, the more it will give rise to unplanned uses. Feenberg (1999) has argued how users of technology subvert a technological system (by

taking advantage of what he calls the ‘play in the system’) and derive alternative, sometimes disruptive, uses of a technology. Digital technology, of its own nature, encodes anything we can perceive (images, sounds, smells etc.) into a stream of bits thus making it perfectly duplicable. All of digital technology depends on this fundamental action: copying. It is because digital technology is so efficient at duplicating symbols, over time and space, that it has emerged as such a widespread mode of communication. It is this feature that is being exploited by what could be called ‘deviant users’ to subvert the system.³²

Every form of communication between people embeds some form of self-expression of the communicator (Edgar, 2004, pp. 144-145). If dialogue or actions in the form of communication have any effect other than that of passing data around, they also represent, to some extent, the rationality, judgements and preferences of the communicator. In addition, marketing strategies reveal how powerful messages which resonate with one’s own self-image can be. In short, a lot of the payload of human communication involves some individual’s assertion of their own identity or self-image. Even if self-expression were only a minuscule proportion of human communication, it would still be significant.

Feenberg expresses this sentiment in a way that is resonant with Foucault’s ethics when he claims: “Our destiny is inextricably involved with the progressive unfolding of capacities for free self-expression, the invention of the human” (Feenberg, 2002). Keeping in mind how efficient digital technology is at manipulating perceivable symbols, and its intrinsic replication capabilities, it is easy to see how in the realm of art digital technology in fact greatly expands the possibilities for self-expression (cf. Burgess, 2006; Walker, 2005). One need only mention the explosive growth in high quality non-professional stock photography that a combination of digital cameras with the Internet has brought about (Zalcman, 2007).

Digital technology, by reducing to streams of bits all meaningful symbols it manipulates, is both powerful and flexible. By being so flexible, it also excels at encoding self-expressive communication. For example, on YouTube a video clip is an encoded expression of one’s tastes, maybe even of one’s own self-image. The clip itself is part of a digital persona – a sum collection of all the self-expressions one makes of him/herself available to society. Perfect duplicability implies that no part of the message is lost in transmission (unless it is explicitly removed). It also means that subversions can become more easily cumulative, as the original and its meaning are not destroyed in the process of subversion.

Given that all technologies can be subversively appropriated, and that the more flexible a technology is the more open to subversion it is, digital technology invites subversion like no other technology has done before. Paradoxically, the more precise and reliable the expressive payload of a technology is, the more it is possible to create derivative and alternative expressions via that technology. Only the most flexible technologies are ‘efficient’ enough to supply so much possibility of self-expression. The digital way of thinking, where the world around us is understood and described using the terms and concepts of digital technology, is fast becoming a predominant ideology in the most developed countries. The potential for this digital ideology to become the dominant one depends on two factors: 1) its capacity to

32 The first instance of subversion due to digital content’s duplicability that comes to mind for most people seems to be peer-to-peer piracy of media. It is important to note that whenever an open API is used, e.g. to include a YouTube video in a Facebook page, or to present a Google Maps route to a hotel on an accommodation booking site, duplication is also fundamental. Subversive use of such features need not be malicious e.g. podcasts, automated Twitter feeds from weather stations, and the use of Flickr and Wikimedia Commons as a source of photos for reputable journals and magazines, are all non-malicious subversive uses of ICT that are now joining the mainstream.

abstract and universalise that which we can perceive; its encoding as a stream of bits texts, sounds, pictures and identities; and 2) that the tools and algorithms that manipulate or move bits can be easily adapted to move any sort of meaningful token (in its encoded form). Since digital technologies are themselves composed of digitally encoded symbols (software encodes algorithms as binary data), as in a chain reaction, subversion gains the power of abstraction and universalisation from digital technology. This means there is an increase in the possibilities for subversion of digital technology to the extent that one could say that subversion is not only unavoidable, but an integral part of the driving ideology itself.

In the factory each worker is placed in front of a station adequate for the task they are to perform. In the information economy each worker has a computer. It is as if the whole factory is at the hands of every worker. This means that the manager can assign any task to any worker, as each has the full tool-set available, which is very convenient for achieving efficiency. It also means that any subversion can spread, as all the tools needed for subversion have to also be provided to all workers. Digital technologies have the potential for cutting through any domain of life. The customer support operator, the clerk at a bank, or at a supermarket checkout, and my mum at home, all have the same basic tool-set. This means that subversive action can also cut across domains. By cutting across domains the exclusivity of a technology is reduced, the space for relevant opinions is expanded, and the possibility of undesirable effects for previously excluded domains becomes more readily identifiable. The varied perspectives that digital subversion brings into the fold of a technology make it more equitable, equality being a prerequisite of democracy.

Subversion ↔ Deliberation

When GPS was developed and deployed it was a military application of high precision digital signal processing. As the signal from GPS satellites is broadcast down to earth anyone with a receiver can obtain this signal. The U.S. Military implemented a feature called Selective Availability (SA) to prevent its enemies from using this technology against the U.S.A. Selective Availability introduced errors into the signal so that public use of GPS would be much less accurate than when the same signal was used by the U.S. military, which could correct for those errors. As use of GPS spread out from the military to maritime and other uses, the U.S. Coast Guard started deploying Differential GPS (DGPS) beacons. DGPS is basically a system that analysis the GPS signal at a known fixed location and broadcasts corrections. DGPS helps mariners navigate accurately close to shore, thus increasing safety at sea. The Coast Guard not only subverted the original intended use of the technology, but used the flexibility of digital signal processing technology to undo some of the effects of SA. When the use of GPS spread and grew in a wide variety of contexts not originally imagined (including sports and games) political pressure, spearheaded by commercial interests, led the U.S. President to order the shutting off of SA. The potential of subversive action to alter the positions of power is even more poignantly visible in the 2007 decision that makes sure new GPS satellites will not even be equipped with SA technology (PNT, 2010). GPS has, in part due to subversive action, transitioned from military to a dual-use application even for the establishment, with the civil role taking over as the primary one.

While GPS is a digital technology, there is nothing in this story that depends on the digital nature of the technology. On the other hand, the wide availability of powerful digital signal processing technology must have at least contributed to the speed at which the story unfolded. Subversion of digital technology is not, in principle, any different from any other

technological subversion, but the scale, speed, and virality³³ of digital subversion reach such magnitude that digital technology can be considered a qualitatively different genre of technology with respect to its potential for subversion.

One example which can serve to highlight the radical effects of scale in digital technology also comes from the military. This time the digital technology is that of encryption. The U.S. government forbids the export of certain military technologies by private enterprise. This is to protect its military technology from falling into the wrong hands. For a long time it was illegal to export certain digital encryption technologies that were classified as military grade hardware (Grimmett, 2001; RSA Laboratories, 2010). Export was allowed for encryption technologies that used a short password (5 letters long or 40 bit keys) as this was not considered military grade. On the other hand, the export of the equivalent technology updated to use long passwords (32 letters long or 256 bit keys) was prohibited. It seems that for the U.S. Military a difference in scale made a difference of quality. About 27 letters worth of information going into almost equivalent algorithms is enough to make one into military technology that needs to be protected, but not the other.

Since digital technology cuts across many domains of life, this very same encryption technology is also a very useful tool for ensuring privacy in private communications and proving the identity of the parties to a digital business transaction, as it can be useful for hiding illegal activity. So, not surprisingly, this technology was subverted for civilian use, first by hackers and early adopters, but eventually also by businesses. This sort of encryption was, and still is, widely used to protect privacy by making eavesdropping of online communications pointless.

The export prohibition made adoption of this technology outside the U.S. difficult if not impossible. This limited the usefulness of the technology to those wanting to communicate with others outside the U.S. It also meant that non-U.S. citizens had less protection available for their privacy. The radical scaling properties of digital technology are poignantly displayed in how some privacy activists challenged the export regulations. The code of the encryption algorithm—the core of the technology—was written and rewritten in different programming languages and in ever shorter formats. Some hackers reduced the code to just 3 lines in the Perl programming language. These 3 lines of code were then distributed as far and wide as possible using as many varied ways as could be imagined such as embedding into images, as hidden comments in internationally visible websites and printed on t-shirts which one would wear when travelling. The most extreme form of this subversion was when some individuals tattooed on their skin the 3 lines of code, in the process turning their own body into export restricted military hardware (Back, 2003). Eventually the U.S. government saw the business potential of having international secure transactions online and the export restriction was lifted, or rather, the technology was re-classified as not military grade (Grimmett, 2001; RSA Laboratories, 2010).

Feenberg presents subversion as a means for democratization of technology. By subverting the given classifications and purposes of a technology, users gain some power of decision making, and reduce the potential of having choices imposed upon them by powerful third

33 “An object, even an immaterial object, is considered to be viral when it has the ability to spread copies of itself or change other similar objects to become more like itself when those objects are simply exposed to the *viral object*. This has become a common way to describe how thoughts, information and trends move into and through a human population. Memes are possibly the best example of viral patterns.” (Wikipedia contributors, 2010a)

parties. Subversive action in the digital domain, in and of itself, always includes a democratising potency, even before its very consequences materialise. This is because in cyberspace all actions involve communication, and technological subversion implies an expression of individuals' or communities' will. Therefore digital subversion expresses in technological form the will of the people as brought about through inter-subjective communication – this is the core of democracy under a discursive interpretation.

This does not mean that the outcomes of digital subversion, the resultant technology, is necessarily beneficial to *any* democracy. Rebel groups might subvert some digital technology or other to create a weapon and launch a cyber-terrorist attack on a democratic state. That is an anti-democratic use of a subverted technology. Yet, if within that radical rebel group the process for creating the cyber-weapon is indeed subversive and involves modulation of an available technology such that its meaning changes to conform to the world-view of that community, that process will require the practice of the core tenets of deliberation (mutual respect, provisionality, evidence based judgements etc.) amongst the rebel group's hackers.

On the other hand, the sort of alternative uses of technologies that typically make it to public attention are beneficial to democratic communities in general. Consider the way popular alternative uses spread online. Most core online technologies can be considered as subversive developments. E-mail, the World Wide Web, Blogs, Wikis, BitTorrent, all were developed in reaction to a limitation the given order of things imposed. Since any PC can be deployed as a server for any of these technologies, these technologies tend to be accompanied by a distribution effect on resources. No longer does one have to depend on a state postal service, if one is willing to adopt email, nor does one have to rely on publishing houses to make their content available. This distribution effect mirrors the requirement of equality for democracy. This is not the one person-one vote kind of democratic equality, but the equality required by deliberative democracy, where each voice can express itself equally, without intimidation because of some relationship of dependence.

The need to overcome knee jerk and emotive decision taking within deliberative democracy is also reflected in subversive action. Any such action has consequences which need to be considered in a context of the community. Peer-to-peer file distribution is a typical example. By eliminating a central authoritative source for the data acquired, file sharers become dependant on the goodwill of others to obtain the data. The need to reciprocate such goodwill becomes a functional requirement of the technology. This is so critical that it has been, in places, coded into the technology. So called leechers—peers on the network who download without sharing—can be ostracised by banning them from the peerage network. This is similar to the possibility, in a deliberative context, to shun those whose participation is disruptive to a deliberative exercise (e.g. a moderator can silence someone who constantly interrupts and wants only their opinion to be heard).

In the context of deliberative democracy, subversion is a democratizing activity at an even more basic level. The constant opposition to the *status quo*, the search for unplanned appropriations of a technology, be it in reaction to a limitation or through serendipity, reflects the basic tenet of deliberation whereby any statement is to be justifiable in the face of opposition. Deliberative democracy also involves the possibility of re-evaluating previous decisions on the basis of new evidence or changed circumstances. Deliberative practices are themselves always open to question under the conditions of deliberation. Subversive uses of technologies can join the mainstream to eventually be subject themselves to subversive use.

The relationship between subversion and democracy is not coincidental. While Feenberg's theory is not a purely constructivist one, the notion of subversion does rely on the possibility of users interpreting the meaning of an artifact differently from its designer. "There are clear similarities between deliberative democracy and social constructivism, as Bijker himself noted but did not develop. ... Deliberative theory is clearly constructivist, rather than foundational. Effective deliberation rests on 'frames' that are constructed by the participants, through which specific technologies may be assessed and assigned meanings." (Hamlett, 2003, pp. 119,134).

Blogging software, a subversive use of web page scripting technologies, developed as a hacker's tool to ease maintenance of open diaries. As the technology became popular and mainstream it turned into a personal publishing tool and a community tool to share news and discuss any topic. The mode of publication popularised by blog software, where each entry would allow for registered readers to post comments and discuss the article, became adopted by newspapers and other authoritative publishers. The rise in popularity and volume of information posed the problem of an overload of distinct sources, all competing for attention. The reaction to such overload takes the form of RSS and other forms of online syndication, with accompanying news feed aggregation software. As feeds from various sources are aggregated by third parties and republished, the 'authoritative source' quality of newspaper/journalist blogs (already a subversive use) becomes once again subverted. In the meantime, the original concept of collaborative publishing gets re-appropriated and combined with 1) a reaction to the lengthy, semi-formal style of blogging, and 2) with the technical restrictions of mobile devices (viz. the length of an SMS). The result is Twitter, a subversive use instigated by a corporation! The next development in this feedback loop of reactions seems to be the redistribution of micro-blogging technology. In reaction to the issues concerning privacy settings on Facebook, and to the power concentration of centralised services like Twitter, a grass roots movement to hack together from existing technologies a set of user-owned equivalent services is now becoming vocal and active.³⁴

If we take Lessig's (2006) notion that in cyberspace 'code' functions like law and combine it with Sunstein's (1995) idea of the expressive function of law, we can consider code as having also an expressive function. Under such a conception the above condensed tale of the evolution of blogging can be seen as a form of discourse. A claim, in the shape of a software platform, is contested by being hacked into an alternative platform. Alignment to one statement or the other is declared by people when they adopt the technology. The claims can come from anywhere, be it from commercial projects or lone hackers. Success evermore depends on the stickiness/virality of a technology. While virality is used to describe how catchy, or addictive a technology is, it depends on a certain level of reciprocity (J. A. Berger & Milkman, 2009, p. 24). All decisions as to which is the dominant technology are always provisional. While not all digital technology evolves in this quasi-discursive manner, the pattern can be discernible in most of what is referred to as Web 2.0, and particularly in 'open' technologies.

What differentiates the subversion of digital technology from the subversion of other technologies, bringing it much closer to deliberation, is a difference in scaling capacity, speed and resource load. Compare the evolution of blogs with the subversion of hybrid electric vehicles (HEV). Objecting to the design of a particular blogging software (e.g. the lack of backup functionality) takes the form of hacking that software so it conforms to one's vision of

34 e.g. the Diaspora project. See <http://www.joindiaspora.com/> (Retrieved 11th Oct. 2010).

what it should be (e.g. writing a plug-in that implements backup functions), then publishing that modification. If users download and deploy the modified version they are aligning themselves with the statement made by the hacker (e.g. “this blogging software ought to have backup functions”).

If one objects to the design of an HEV (e.g. that it cannot be plugged into the grid for recharging) one can of course modify their car to make it conform to one’s vision (e.g. mechanically modifying the circuits to add power-line charging). But when the mechanic who makes such alterations shares the knowledge of how it was done, other HEV owners do not immediately have the possibility of aligning themselves to his/her statement by adopting his/her version of the HEV. Unless the HEV manufacturer adopts the modification, the time, skill and effort required will mean that the subversion will, most likely, not spread.

If deliberation through cycles of subversion of digital technology resembles deliberation exercises such as the Deliberative Poll, deliberation through cycles of subversion of motor vehicle technology is more like attempting deliberation through hand written surface mail. While in theory they should be equivalent, the scale, speed and resource load difference means that digital subversion resembles deliberation in a qualitatively distinct manner.

Anti-subversion

I have argued that technologies, in use, modulate our moral landscape and have political effects. I also argued that subversion is an integral part of the ideology that drives digital technology. The subversive use of technologies has a democratizing character, the use of ICT in subversive ways co-constitutes a moral framework which highly values equality of actors, reciprocity of action, diversity and goodwill, the hallmarks of deliberative democracy. The will to subvert digital technologies is a character trait that has a lot in common with the will to democracy. Deliberative democracy also relies on access to information, but ICTs provide that by their intended (instrumental) use as facilitators of human to human communication (see Hamlett, 2003, pp. 124-127).

It would appear that this is a recipe for more democracy similar to that of the invisible hand of the market generating wealth. As a free and open market space, left to its own devices, will shape itself into the most efficient wealth generating arrangement, the ubiquity of digital technology will bring forth more democracy. If this were so, institutions like the EU, which want to strengthen democratic values, only need to push forward more digital technologies. The rest will take care of itself. Unfortunately things are not so simple. The idea of a necessarily beneficial invisible hand in markets has been under severe criticism and the recent economic crisis seems to justify such criticism. The notion that free markets are efficient means of generating wealth, or that digital technology invites subversion, does not imply that the one necessarily follows the other. It has been argued that markets need regulation to conform to other ideals and morals (Sunstein, 1995, p. 2039). Since unintended uses of technology can be undesirable, technology use is also regulated. This becomes the major obstacle to subversive democratisation.

Unintended use of a digital technology can, of course, be maleficent. Such uses are undesirable, and it is therefore justifiable that certain uses are prohibited. Since digital technologies are by nature generic technologies, the regulations which limit use tend to be blanket norms which also cover desirable subversions. The meanings of the term ‘hacker’ is illustrative of this point.

The Oxford English Dictionary (1989) defines hacker as:

- ...
3. *a. A person with an enthusiasm for programming as an end in itself colloq. (orig. U.S.). ...*
b. A person who uses his skills with computers to try and gain unauthorized access to computer files or networks. colloq.

The Merriam-Webster (2010) says:

- ...
- 3 : *an expert at programming and solving problems with a computer*
4 : *a person who illegally gains access to and sometimes tampers with information in a computer system*

While Wikipedia (2010c) defines it as:

- ...
- Hacker (computing), a contentious term used for several types of person:*
- *Hacker (computer security) or cracker, who accesses a computer system by circumventing its security system*
 - *Hacker (programmer subculture), who shares an anti-authoritarian approach to software development now associated with the free software movement*
 - *Hacker (hobbyist), who makes innovative customizations or combinations of retail electronic and computer equipment*

All these explanations could be summed up by defining a hacker as someone who makes subversive use of digital technology. All infringement of privacy online and all unauthorised access to digital systems involves some level of hacking. On the other hand, not all beneficial innovations emerge from hacking. This leads to a general negative view of hacking as reflected in the way the media uses the term. This is also reflected in management attitudes towards the allowed uses of computers in offices. It is certainly not illegal, nor automatically disruptive to use a certain web browser instead of the one put on your PC by the supplier. Yet most IT policies in companies and public institutions disallow their employees from making a choice on matters of technology. Often the rationale is based upon a security concern. To generalise, the concern over *inappropriate* use of digital technology results in a blanket prohibition of *any* alternative or unplanned use of that technology.

The roots of hacker sub-culture, to which today's most accomplished producers of MBDGs can trace their lineage, were set in the 60s and 70s at and around the Massachusetts Institute of Technology (MIT) and similar institutions which at the time were pioneers of computer science and research. These communities evolved a peculiar moral code, the Hacker Ethic, which valued above all else freedom of access to information and technology, meritocracy and the hands-on approach to achieving goals.

Hackers believe that essential lessons can be learned about the systems—about the world—from taking things apart, seeing how they work, and using this knowledge to create new and even more interesting things. They resent any person, physical barrier, or law that tries to keep them from doing this.

(Levy, 2010, p. 28)

Steven Levy (2010, pp. 27-122) gives colourful descriptions of how a band of brilliant young men at MIT fought a constant battle with bureaucrats to gain access to the hardware and the information they needed for their wacky projects. For the bureaucrats computers and software were tools to be used efficiently to attain specific targets (an instrumentalist perspective). For the hackers machine code was itself a means of self-expression, the well coded system an end in itself (a constructivist perspective). That for a group of brilliant young men, with poor social skills, self-expression took the form of code might not be surprising. Still, it is at least intriguing, as is the fact that the most creative and innovative solutions came from those with no tolerance for externally established rules and procedures. They had their own code of behaviour which evolved along with the technology they built. The code which one produced was what mattered, just as in deliberation it is the argument's worth that matters, not who makes it.

Eventually the hacker haven that had formed at MIT dissolved. Under pressure regarding security concerns from the Department of Defence, the main source of funding, and with the enticing lures of commercialisation beckoning, which required trade secrets, the idyllic world of the early hackers unravelled (Levy, 2010, pp. 442-450). While the very nature of digital technology invites subversion, which reflects a democratic character, this urge is constantly frustrated by external (occasionally non-democratic) norms intended to prevent abuse, theft or disaster. The ever decreasing cost of hardware and the spread of the Internet has been the driving force for a re-emergence of an evolved Hacker Ethic which is most clearly manifested by programmers developing convivial FLOSS. Norms and regulations still often frustrate the subversive drive of today's hackers.

Intellectual property law is the primary source of such frustration. Copyright laws are intended to regulate copies, thus safeguarding the rights of authors. But in the digital realm any use produces a copy. So any non-sanctioned use of digital technology, if not outright illegal, will almost always encounter copyright law, making it legally problematic. For example, the prevalent use of peer-to-peer file distribution networks nowadays is copyright infringing activity. While proponents of strong intellectual property rights can offer various good arguments why widespread piracy ought to be prevented, it is important not to lose the democratizing potential of peer-to-peer technology in the effort to stop piracy. Completely banning peer-to-peer technology as a means of stopping piracy would mean that any potential benefit from this technology would be lost. We would also lose the democratising effect of its subversion. Today peer-to-peer technology is not illegal *per se*. Still, anyone doing any sort of experimentation with peer-to-peer technology is pictured as trying to help the pirates. This negative image also frustrates subversive activity. Unfortunately, such is the fear of unacceptable use, that even the exploration of alternative uses is looked down upon.

There are four ways in which intellectual property (and other) laws can frustrate subversion, only the first of which is reasonable in my opinion. 1) Subversive digital activity can indeed be abusive and malicious, such as when private networks are intruded upon, and personal data used without permission. This form of subversion is clearly illegal, and justifiably so. 2) Subversive digital action is sometimes illegal because of laws that are unjust, or at least laws which are highly contestable on various points. An example would be a law that prevents reverse engineering. Reverse engineering is a fundamental practice in subversion and has a valuable educational function. Such laws should be opposed also because they unnecessarily impede democratic development through the use of technology. 3) Intellectual property law is occasionally used to frustrate subversion efforts that are perfectly legal. The threat of legal

action is sometimes used to scare hackers from engaging in what, on deeper analysis, turns out to be perfectly legitimate behaviour. Even when one is right, the costs of defending one's digital activity in court can be prohibitive. 4) Lastly, the campaigns against piracy pour scorn over any sort of hacking, painting with the same negative brush all kinds of unintended use. The effect is that hacking becomes socially marginalised behaviour, even if it mostly brings benefit to society and civic virtue to those engaged in it.

It is ironic how the deployment of DVD region code technology was allowed to proliferate by self-declared democratic states which favour globalisation when such a technology is most likely anti-competitive (e.g. Monti, 2001). If a company were to refuse employment to a person based only on the place of birth of that person it would obviously be considered as acting in a discriminatory fashion. On the other hand the subversive use of a PC to overcome such limitations in DVDs is not celebrated as a triumph for equality but deemed illegal, because it goes against the intended use of the technologies.³⁵

Besides laws and pre-conceptions there is another reason why, even if tantalising, subversion of digital technologies might not come to be: work. Hacking at a piece of software, or a digital image, requires time and sweat-of-the-brow. It might be fun, satisfying, and produces rewards and benefits which are very valuable and hard to measure. But the amount of effort required is substantial, and all too often without monetary compensation, mainly because it falls off the mainstream revenue generating modes of production. It is easy enough to start a blog, just register with a service like blogger.com and you have a fully featured blog at your disposal. It is another matter altogether to keep the content flowing, to do the blogging. The fact that several individuals take on such tasks is indication enough that the rewards are considered worthwhile the effort by some. That so many other netizens are not engaged in any form of subversive re-appropriation (even when they find the established order objectionable) indicates that the rewards to be obtained are not recognised as such or are insufficient.

Conclusion

To unleash the democratic potential of digital technologies two parallel actions need to be performed. One needs to de-regulate (or re-regulate) in favour of subversive appropriation of digital technologies, while simultaneously regulate against undesirable use. Regulation is typically thought of in terms of law. In this context a more general realignment of normativity in line with the new conditions of being, which are due to digital rationality, is required. Norms can also take the form of internal institutional or corporate policy, or they can be implemented in software. These two parallel actions involve a shift in cultural attitudes towards the use of ICT. It requires the abandoning of the instrumental view of technology based on purposive-rationality in favour of a more substantive view which can relate to discursive-rationality. Additionally, resources directly targeted at promoting democracy (such

³⁵ Legally speaking the objection is to the circumvention of copyright. As argued above any digital instantiation of an object is only meaningful in combination when in use with appropriate technology. The will of the author upon digital copies is always also a specification of what is the acceptable intended use of the technology which manifests that digital object. For more details on Digital Rights Management schemes used on DVDs and how these have been subverted see the following Wikipedia articles:

Content Scramble System: http://en.wikipedia.org/wiki/Content_Scramble_System

DVD region code: http://en.wikipedia.org/wiki/DVD_region_code

DeCSS: <http://en.wikipedia.org/wiki/DeCSS>

libdvdcss: <http://en.wikipedia.org/wiki/Libdvdcss> (All retrieved 11th Oct. 2010).

as those spent on eDemocracy) could be alternatively used to reward, or at least recognise the worth of, the effort required to make use of flexible and subversible digital technologies. While digital technologies in use can cultivate democratic values, an institutional recognition of this fact, with appropriate action, would substantially reduce the barriers to this effect, which effect has hitherto been difficult to reveal.

Technological choice towards democracy is choice towards subversible, flexible and appropriable technology. The category of MBDGs can help identify some technologies which possess these properties without infringing established norms of acceptable behaviour. In the next chapter I will look at some of this kind of MBDG and their democratic characteristics. Some other MBDGs (particularly mash-ups and peer-to-peer networks) are legally contentious, but I believe they are an expression of acceptable use. In these cases the democratizing potential of the technology is in conflict with currently prevailing norms. Here the attitudinal shift needs to be supplemented by a realignment of laws to be supportive of a notion of democracy that is coherent even in cyberspace, namely deliberative democracy.

The aim of this chapter was to find out if ICTs can cultivate, through use, democratic virtues in their users. Technologies in use co-constitute the moral landscape of their users. ICTs are no exception. In fact, the underlying mechanisms of digital technology, encoding and duplication, invite subversion at an unprecedented level. But subversive appropriations of technology can produce undesirable results, thus digital subversion is all too often considered undesirable in itself. To unleash the democratic potential of ICT it is necessary to identify and endorse, rather than shun, non-maleficent subversible technologies, while at the same time regulate against anti-democratic technologies, even if instrumentally justifiable. The technologies which drive MBDGs are one class of ICT which cultivate democratic virtue.

— 4 —

**Deliberative Features of the
Use and Production of Mutual
Benefit Digital Goods**

In this chapter I shall look into a couple of exemplary MBDGs for evidence of the notions I have developed above. I will then also look at a couple of digital goods which are not so obviously of the mutual benefit kind. This is not intended to be an exhaustive empirical demonstration of the concepts. What follows is a sampling of intriguing activities that corroborate the ideas developed, and hints at what might be revealed with further in-depth and rigorous discourse analysis or empirical investigation of the phenomena under scrutiny. Digital goods can be categorized as MBDGs by the user appropriation they afford, but their democratic potential is most clearly in evidence in their method of production (when they are produced by a community of contributors, rather than lone individuals). Under a naïve conception of a market driven by demand and supply, the increased use of MBDGs ought to result in an increase in their demand and hence their production. This in turn yields the desired democratic development for the developers which eventually, one would hope, would spread to the wider population. I shall also attempt at exposing other (less roundabout) mechanisms by which the democratic potential of MBDGs is actualised through use, even if a simpler argument is required when focusing exclusively on production.

Wikipedia

Wikipedia is the most exemplary MBDG available. It is very much a product of the Internet age, used and recognised by millions every day, and attracting both praise and scorn for its way of doing things. Wikipedia explicitly fosters a communitarian philosophy, both in its working methods and in its intended purpose. This is not to say that Wikipedia is an ideal or perfect MBDG, it has some shortcomings too. Practical considerations sometimes have to take precedence over the ideals behind the project. Still, as one never expects to see a perfect form of democracy in practice, especially on very large scales, ideal MBDGs will always be hard to come by.

Wikipedia is one of the top 10 websites worldwide (Alexa Internet, Inc., 2010). It describes itself as an online encyclopaedia of over 10 million pages written collaboratively by its own readers and, as its own slogan says, which “anyone can edit”. Wikipedia is the most recognisable instance of wiki technology. The first wiki was developed by Ward Cunningham in 1994 with the aim of providing “the simplest online database that could possibly work” (“Wiki: What Is Wiki,” n.d.). A wiki makes it possible to edit a web page online with relative ease. The focus of the technology is on collaborative editing and interlinking between pages. The three aspects, editing a web page directly, collaborative online editing, and easy semi-automatic hyperlinking, when combined with the comparatively little technical skills required to use them, have been a revolutionary concept on the web. Today wikis are the tools of choice for online collaborative writing. Wikipedia’s content is freely licensed. Anyone can use that content in whichever way they like, even for commercial purposes.

Earlier I have defined digital goods as any digital object that can be meaningfully bounded. This implies that in such a complex project as is Wikipedia there will be many perspectives through which one can consider it as an MBDG. Each and every Wikipedia article can be extracted and digitally stored as a separate entity (e.g. as a single file on a disk) so each article is an MBDG in its own right. The whole of Wikipedia too can be considered as one large MBDG. Even if there would be substantial technical issues with making a copy on disk of all of Wikipedia, this is theoretically possible. More importantly talking of Wikipedia as ‘a thing’, as an online encyclopedia as opposed to a printed one, is meaningful. While the

Wikipedia as digital object might be difficult to frame physically (it runs on multiple servers in different locations) it is well bounded in terms of meaning.

To examine the democratic or the mutual benefit potential of a Wikipedia article one has to determine the appropriate context, user-base or citizenry that is affected. Different perspectives of who the user is, and which MBDG is being considered, yield differing potentials for benefit and democratic value. For the current purposes the focus shall be on Wikipedia's contributors/editors. Of course an article also affords benefit to the 'common user' or consumer of the article, some person who gains knowledge through reading the article. The widespread dissemination of information to the public is a desirable aspect of deliberative democracy, but there is not the space here to delve deeper into other democratic implications of using Wikipedia as a reader.

The Articles

Any substantial article in Wikipedia is very much a collaborative effort of various contributors fulfilling various tasks (e.g. editing, proof reading, adding images, formatting, etc.). The various tasks are not undertaken in some orderly or organised fashion. The process is typically asynchronous. Each article has its own discussion page and a detailed history of each and every change that occurs. Articles emerge as an amalgam of various individual acts, some substantial (e.g. writing the bulk of the text of an article), others almost insignificant (e.g. correcting a single spelling mistake). Eventually, through a succession of edits, revisions and other operations an article develops. In a sense an article is the result of its own history up to the point in time it is accessed.

But, if the article is the sum total of a bunch of uncoordinated actions by separate individuals, who is the author of the article? Who has created this thing? Whose ideas does it express? The answer is quite simply that a Wikipedia article is created by the community. In the case of the single article it is a sub-community of the wider Wikipedia community that specifically worked on that article. One might wonder who these people are and how a person comes to be a contributor.

There is really only one way for any individual to become a contributor: to contribute. This triviality becomes significant when compared to the citizenry of a democratic nation state or the participant group in a deliberative exercise. Within a nation state, one's right to have a say upon collective action, or the right to express one's democratic will, is disassociated from one's level of engagement with the decision taking process that leads to that action. Any citizen has the right to vote, e.g. in a referendum, irrespective of whether that person even has any reasonable opinion on the matter at hand. What makes one a citizen and therefore provides for the right to vote are things such as place of birth, nationality of parents, etc.

Deliberative exercises, such as the Deliberative Poll described previously, overcome this disassociation by ensuring that those who decide upon a course of action are actively involved in deliberating about it. The problem of deliberative exercises is that deliberation only proceeds properly with a small number of participants, as many as can have a reasonable face to face discussion with everyone voicing their opinion. Even if the deliberators are divided in groups, there still is the issue of actually hosting the deliberative exercise. So one has to find a way of ensuring that those participating in deliberation properly represent those affected by the decisions taken by that forum. On first considerations, self-selection should produce the fairest outcomes. Anyone who is interested is welcome to come and debate. Those who chose to stay out of the debate are implicitly stating that they are not interested in the discussion,

either because the action does not affect them, or because they have no preference for any particular course of action. In reality self-selection faces various practical problems. There might be individuals who would like to participate but are unable to. Maybe one cannot be physically present at the deliberation, because of disability, or large distance, or perhaps has not been informed in time. This is a problem of accessibility to deliberation. Additionally interested parties might organise themselves to overwhelm a deliberative exercise. Interest groups might either bias the deliberation by over representation, or if there is more than one group, factions might emerge that destroy the collaborative nature of good deliberation. This is a problem of ensuring the goodwill of participants. Given these and other problems with self-selection Fishkin's use of scientific random sampling (Fishkin, 2009b, pp. 111-119) to provide fair representation seems the most sensible choice.

A Wikipedia article is in some ways a deliberative exercise. After an article reaches a certain size, complexity and/or popularity its content is, in practice, the result of an ongoing debate. Sometimes this is explicit, and the discussion pages of articles track the history of these arguments. At other times the discussion takes the form of actual edits, with different people fine tuning the 'statement' made by the article so that it is clearer or more informative.

As a microcosmic deliberative exercise, individual Wikipedia articles provide an almost idyllic setting with respect to accessibility to deliberation. Wikipedia articles are targeted towards individuals with Internet access, and any person with such access who has an interest in the outcome of the article creation process can participate in that process. Because discussion generating the article occurs asynchronously and in perpetuity (Wikipedia has no target date for 'going to the presses') the problem of time for participation depends entirely on the individual, not on some external organising institution. Moreover, all the oft stated advantages ICTs offer for overcoming physical barriers to access are available. While one might demand face to face interaction when debating a common action that might affect one's bodily integrity, ICT mediated interaction is sufficient when the outcome is an informational digital good.

The goodwill of self-selected participants can never be guaranteed, but Wikipedia manages to keep a high enough level of goodwill by equating editors with contributors. One can only be an editor by putting in some sweat-of-the-brow work that contributes to the project. Voicing one's opinion has a cost. That cost is resources (viz. time) dedicated to the common action. This is to say that only those who give something to the project, which is a discursive exercise, get a voice in the decision taking. The system is not fool proof. Editors intent on pursuing their personal agendas do often make edits which disturb, rather than help, the common effort. This is where the social dynamics of Wikipedia come into play. Those collaborating on an article develop relationships which enable editors to make judgements on the intentions of one another. The community has a capacity for identifying and isolating those with non-communitarian intentions. Wikipedia articles highlight, by their very nature (i.e. Wikipedia's code in Lessig's sense of code), the link between contributing to a pool of shared resources and the possibility to shape common action.

Ever Changing

An important aspect of deliberative democracy is the principle of provisionality. All the norms and rules upon which a democratic process operates are also under the purview of that very process. Laws and rules established through deliberation should never be absolute and atemporal. Even well established norms can, and should, be challenged in the future, should

new insights reveal problems. Most importantly, the norms by which a decision is judged to be democratic or non-democratic, as well as the rules of procedure by which such decisions are reached, should also be open for review. How is the principle reflected in Wikipedia?

This principle is manifest in Wikipedia at two levels, at the article level, and at the level of Wikipedia as a whole. Oddly both phenomena have mostly attracted criticism.³⁶ On the article level, Wikipedia has often been criticised as being unreliable because its content changes constantly. Critics complain that since Wikipedia is never stable it cannot be considered a dependable source of knowledge, thereby implying that only true knowledge which has some universal or permanent nature is dependable enough to guide human action, and that such knowledge can be found in encyclopedias. Supporters of Wikipedia counter that as more and more knowledge is added, Wikipedia is most capable of keeping up-to-date. It needs to constantly change if it is to remain up-to-date and accurate.

These arguments demand a positivistic view of the world, where one can arrive at certain and objective knowledge. But each Wikipedia article is an expression of a community. Such expressions depend on the world view of the community (within which distinct individuals might have conflicting world views) and this can be more or less stable but never fixed. I contend that the unstable nature of articles on Wikipedia is a phenomenological parallel to the principle of provisionality in deliberative democracy. Articles which change a lot, and frequently, concern concepts upon which the community has yet to approach consensus. As the notions used by the community evolve and stabilise so do the corresponding articles, until such a point where new evidence requires a re-opening of the discussion.

The Rules

This provisionality operates also on the level of the project as a whole. The Wikipedia pages which describe the rules, procedures and norms to be followed are also themselves wiki pages which can be modified by anyone following pretty much the same process as for any other page on Wikipedia. Wikipedia has come under criticism for its large set of rules. These are sometimes rather complex, or occasionally contradictory, and newcomers tend to be overwhelmed when their contributions are undone because of some obscure rule.³⁷ While these issues are real, it does not reduce the significance of the fact that the rules have been and still are developed along with the project itself, by the same people whose behaviour they regulate, and following the same principles specified by those very rules. Changing a page which specifies a rule is technically no different then changing any other page, but the community surrounding important rule pages is probably atypical, and the demands for justification and consensus would be much higher than for a typical article page.

The provisionality of the norms which editors are expected to follow is safeguarded by a combination of the digital nature of Wikipedia in combination with its Creative Commons licensing. Should a group of editors find the norms unacceptable they are not only free to leave the project, but they can take the project along with them. In theory, anyone can download a snapshot of the database containing of all the content of Wikipedia and establish a new competing project with different rules. In practice this is not that easy, besides the physical resources that are needed (servers, bandwidth, etc.), without its large community

36 See http://en.wikipedia.org/wiki/Criticism_of_Wikipedia and http://en.wikipedia.org/wiki/Reliability_of_Wikipedia (Retrieved 11th Oct. 2010).

37 See <http://blogs.wsj.com/digits/2009/11/23/is-wikipedia-too-unfriendly-to-newbies/> (Retrieved 11th Oct. 2010).

Wikipedia cannot function. Any rival project would need to divert contributors to it, but the possibility that this might happen ensures that the norms embodied within Wikipedia cannot differ too drastically from the general conception the community has of what Wikipedia should be. If the rules did contrast sharply with the will of the community, the possibility of such a split would become much more feasible, and contributors would be more likely to defect to the competitor with the better rules.

The provisionality of rules on Wikipedia is found almost explicitly in its “Ignore all Rules” rule³⁸ which is considered one of the “five pillars” of Wikipedia.³⁹ This rule simply states “If a rule prevents you from improving or maintaining Wikipedia, **ignore it**.” The explanations and justifications given for that simple rule align Wikipedia’s process to one based on a principle of provisionality as expressed by Gutmann and Thompson (2004, pp. 110-119).

Working Together

As described above, joining the Wikipedia community entails contributing work. Because the shape of each article and of the project as a whole is the result of all these contributions, and these contributions are bits of communication, Wikipedia is a collective expression of a multitude of self-expressions. When I contribute text to Wikipedia I am expressing myself. By co-authoring an article, an editor appropriates it, makes it his/her own, and shapes it (in collaboration with a community) to their own self-image and world view. How is it possible that several individuals appropriate the same thing without conflict?

Each article, being digital, is a non-rivalrous good. This means that any individual can grab a copy of the page and appropriate it in any manner they like (within the limits of the Creative Commons Licence⁴⁰) without depriving anyone else of the use of the original. A teacher who uses an image from Wikipedia to illustrate a process to a class of pupils is clearly appropriating the digital good in a convivial manner. But how can the community of editors each put something of their own into a single text, the article which the servers deliver, when they have divergent conceptions of how that article is to be constituted?

There are at least two features which make this possible in practice. One is the history feature, which keeps a full record of the entire exchange and provides a publicly accountable record of one’s statements. So even if one’s expression is not reflected in the ‘final product’, there is an account of how that position modulated the development of the good into its current state. When two editors disagree on how a part of the text is to be phrased the end result will typically be either a synthesis of both versions, possibly facilitated by a third party, or a communitarian consensus decision based on argument of which choice is better. The phrasing which gets discarded has, at a minimum, provoked the justification through argument of the chosen phrasing.

The second feature is Wikipedia’s practice of another fundamental principle of deliberative democracy, that of mutual respect. Another of the “five pillars” of Wikipedia states that “Wikipedians should interact in a respectful and civil manner. Respect and be polite to your fellow Wikipedians, even when you disagree. Apply Wikipedia etiquette, and avoid personal attacks. Find consensus, avoid edit wars, and remember that there are 3,395,242 articles on the English Wikipedia to work on and discuss. Act in good faith, never disrupt Wikipedia to illustrate a point, and assume good faith on the part of others. Be open and welcoming.”³⁰

38 See http://en.wikipedia.org/wiki/Wikipedia:Ignore_all_rules (Retrieved 30th August 2010).

39 See http://en.wikipedia.org/wiki/Wikipedia:Five_pillars (Retrieved 30th August 2010).

40 See http://wikimediafoundation.org/wiki/Terms_of_Use (Retrieved 30th August 2010).

Those who disregard this ideal are practically ostracised from the community. Banning an editor from the servers for misconduct is not uncommon. Rules like the three-revert rule⁴¹ and tasks such as patrolling are practical aids to identifying a lack of civility or of consensus driven decision taking.

So Much To Do

Patrolling involves monitoring edits and new pages and checking that they constitute appropriate Wikipedia behaviour.⁴² Patrolling is the first line of defence against abusive behaviour such as spam or vandalism. Experienced editors also take on the roles of mediators in dispute resolution, when editors with conflicting ideas cannot reach agreement by themselves. Such roles are a form of appropriation by engaging the community. One is not making the content one's own by contributing to it directly, but by engaging the community. By fulfilling roles which are necessary for the community to sustain itself one gains ownership of the project writ large. The role of mediators, patrols, and those responsible for sub-projects such as identifying "Featured Articles"⁴³ or the editors of "The Signpost"⁴⁴ fulfil similar roles as facilitators in deliberative exercises. These tasks ensure the fluidity of the deliberation. In Wikipedia these roles are voluntarily fulfilled by members of the same community the deliberation affects. They are not, as in typical deliberative exercises external, independent and detached functionaries. Significantly, the software code of Wikipedia is also developed by members of the community. The software engineers might not be so actively involved in actual editing, but they are still an integral part of the community. Their opinion is very important, obviously, on technical matters, but they also need to heed the opinion of the community about where the software development needs to go.

The way Wikipedia's automation works also provides a significant level of decentralisation and equity. A significant portion of the automatic edits that happen on Wikipedia (such as uniform formatting of dates, archiving of old discussions, etc.) are the handiwork of bots.⁴⁵ Bots are small pieces of software that act in place of a human editor, through the same interfaces. These are not part of the core wiki software, in fact they are mostly run independently on user's home computers. A bot can use the user account of its 'owner' or a separate one that should be linked to that of a human being. Thus there is accountability for most automatic actions, and decisions taken by the central system through code are kept to a minimum.

Because Wikipedia is so popular it attracts a lot of malevolent attention. Spammers try to use it by placing advertising on popular pages. People who disagree with the content of an article, or want to push their own view, vandalise pages and fill them with content which is not adequate for Wikipedia. This has over the years pushed Wikipedia to limit some of the

41 The three-revert rule (3RR) states: "An editor must not perform more than three reverts on a single page within a 24-hour period. It is intended to avoid edit warring. An edit war occurs when editors who disagree about some aspect of the content of a page repeatedly override each other's contributions, rather than try to resolve the disagreement by discussion. Edit warring is unconstructive [*sic*] and creates animosity between editors, making it harder to reach a consensus as to the right way to improve the encyclopedia. Users who engage in edit wars risk being blocked or even banned from editing." (From <http://en.wikipedia.org/wiki/Wikipedia:3RR> Retrieved 30th August 2010).

42 See <http://en.wikipedia.org/wiki/Wikipedia:Patrols> (Retrieved 30th August 2010).

43 See http://en.wikipedia.org/wiki/Wikipedia:Featured_articles (Retrieved 30th August 2010).

44 The Signpost is Wikipedia's own community-news journal. See http://en.wikipedia.org/wiki/Wikipedia:Wikipedia_Signpost (Retrieved 30th August 2010).

45 See <http://en.wikipedia.org/wiki/Wikipedia:Bots> (Retrieved 30th August 2010).

original freedom editors enjoyed. Also, to manage such a huge project a certain level of bureaucracy is used. There is a hierarchy of users. Administrators and Sysops⁴⁶ can access functions of the software not available to normal editors. They have the power to block or ban users, delete content (even permanently, including its history) and typically their decisions are considered pretty much authoritative. That said, all such officials are chosen by consensus or elected.⁴⁷ All registered users that have on record sufficient Wikipedia activity that the community considers enough proof of commitment can vote. Also, any action taken by an administrator can be appealed in front of the community. Wikipedia's major challenges pushing it in the direction of more bureaucracy are the very large workload of most senior users and certain areas where the application of complex rules is instrumentally overwhelming the discursive spirit that generally guides the project.

Paradoxically while I am here trying to argue that Wikipedia, by virtue of the same features that make it an MBDG, operates in a democratic manner, its own guidelines claim that "Wikipedia is not a democracy ... Wikipedia is not an experiment in democracy or any other political system. Its primary but not exclusive method of determining consensus is through editing and discussion, not voting."⁴⁸ Since it is an encyclopedia, I agree that it is not an experiment in politics. But because Wikipedia has a community which needs to take collective action (even if that action is almost exclusively action through communication) it must follow some sort of political system. I contend that the political system employed by Wikipedia is indeed a democratic one, not a pluralistic or liberal democratic, but a deliberative democratic political system.

FLOSS

Another group of exemplary MBDGs is Free/Libre/Open Source Software (FLOSS). The typical production model for large FLOSS development projects shares much with the way Wikipedia is run. This is no coincidence. The model for Wikipedia was somewhat inspired by the Open Source movement,⁴⁹ Wikipedia's technology is entirely FLOSS based,⁵⁰ and before Wikipedia shifted to using the Creative Commons set of licences it used the GNU Free Documentation License, the licence the Free Software Foundation uses for its documentation of software.⁵¹ Much of the democratic values present in Wikipedia as shown above could be easily identified in the FLOSS community too.

Before proceeding, it is important to emphasise that a piece of software is both a digital good and a technology. Therefore the primary intended benefit from such a good is obtainable through its use as a tool. This is in contrast to Wikipedia where the use of the technology is a pre-condition to the primary intended benefit that can be gained from its goods (information from articles).

46 See <http://en.wikipedia.org/wiki/Wikipedia:Administrator> (Retrieved 30th August 2010).

47 See <http://en.wikipedia.org/wiki/Wikipedia:Elections> (Retrieved 30th August 2010).

48 See http://en.wikipedia.org/wiki/Wikipedia:What_Wikipedia_is_not#Wikipedia_is_not_a_democracy (Retrieved 30th August 2010).

49 See http://en.wikipedia.org/wiki/History_of_Wikipedia (Retrieved 30th August 2010).

50 See http://meta.wikimedia.org/wiki/Wikimedia_servers#System_architecture (Retrieved 30th August 2010).

51 See http://wikimediafoundation.org/wiki/Press_releases/Dual_license_vote_May_2009 (Retrieved 30th August 2010).

My Software

I shall focus first on the appropriation of software goods by end users. As explained in the first chapter the ‘end users’ are individuals with personalities and identities. Those who use software tools constitute their identity also through the use of, and interaction with, those very tools. They are not some mythical being representing the average preferences of everyone.

In this sense of the term ‘user’, software can only meet the needs of end users in one of two ways: 1) designers of software can define who the end user is supposed to be, in such a way that the identity of the person as a tool user is brought to conform to the technical solution; or 2) designers can make their software sufficiently open ended and under-defined in terms of purpose and function, such that various individuals can freely build their conception of what that tool is along with their own identity. The capacity of users of a technology to, as freely as possible, form their own conceptions of that technology is relevant for deliberative democracy because of democracy’s demand for equality of actors. The way this capacity manifests itself in the use of FLOSS can be highlighted by comparing the relationship of software users with software producers in the case of commercial closed software against the case of FLOSS.

When someone walks into a shop, picks a box off the shelf with a software CD in it and buys a software package, you might expect that that person is now the proud owner of the software on that CD. In fact this is not the case. Acquiring software typically entails entering some sort of contractual agreement with the owner of the software for permission to use that software under precisely defined conditions. This is not as strange as it might seem. When I buy a book I do become the owner of the book, but never of the story expressed within that book. Similarly, by buying software one most definitely owns the CD on which the software is inscribed, but what one is paying for is permission to use the intellectual property of the creator. The major difference between books and software is that acquiring a physical copy of a book comes with the implicit permission from the author to use the story therein in a specific way, namely to read it. Now there are not too many differing ways in which a printed story in book form can be used other than reading. This does not necessarily apply for software.

One might object that something like a word processor can really only be used meaningfully to ‘process words’ or that a spreadsheet software can, and is in fact used often, as a simple database application. The restrictions imposed by licenses for software are not about use, they deal with distribution and coping. What one needs to keep in mind is that software is very complex technology, made up of a substantial variety of interlocking parts. Because software is a much more flexible tool in its use than more traditional physical tools, there are many ways in which the potential use of its basic components (algorithms) can be restricted.

Consider operating system software, which provides a basis for other software to interact with the hardware and through that with the user. Whether a computer is considered a ‘server’ or a ‘workstation’ depends mainly on which software is put on it. Still, the operating system component of a server and of a workstation are today practically identical. Most differences are in configuration, not in the underlying algorithms. Yet one can find for sale ‘server’ and ‘workstation’ versions of the same operating system software, both commercial and Open Source. The major difference between commercial software and FLOSS is that in commercial workstation software some of the features which optimise the software for server functions are disabled. What this implies in the case of commercial software is that the way I construct my conception of what this or that machine is (whether server, or workstation, or gaming toy)

is foreclosed by the exigencies of the producer of that software. In the case of FLOSS the vision of the producer is also a very significant factor, but it never impedes re-interpretation of the meaning of the technology.

The producer of a software package, through its marketing arm, declares such and such a software to be a specific kind of thing. The meaning of community produced software, or software appropriable by a community, emerges from the community. The individual or user community making use of that software can always subvert its meaning and the way the software is used. In the case of mutual benefit software, the balance of powers is much more advantageous to the individual, because, by engaging the community of use, he/she gains a voice in the establishing the purpose of that tool.

E-Waste for Equality

A more concrete example of how the use of FLOSS opens up the possibility for the re-interpretation of technology is the work done by organisations such as Free Geek.⁵² Free Geek is an NGO that refurbishes old computers and gives them away to other NGOs. When they receive discarded hardware the volunteers at Free Geek wipe the hard drives clean of any data using software that makes any data on those hard drives unrecoverable. This guarantees the privacy of the donors. They then install Ubuntu,⁵³ a free Linux based operating system and software collection, on the computers they give away. This organisation, and others which follow this model, are using MBDGs to redefine the potential of a device (viz. old hardware) from 'obsolete' or 'waste' to 'useful' or 'community benefiting'. Turning a PC from waste to tool can be achieved with the assistance of non-convivial software tools too. After all big software corporations like Microsoft provide their software for educational and charitable purposes at extremely low cost. But, the use of FLOSS by organisations like Free Geek is not based exclusively on economical imperatives. Their website also makes it evident that the choice is also a principled one which is congruent with the organisations self-understanding of its own purpose and function.

If such used hardware were to include licensed software, the donors would be burdening the beneficiary of that donation with a contractual agreement with a third party. FLOSS allows one to accept charity with no strings attached. The power balance and relationship between donor and recipient is thus much more equitable. Moreover, the receiver of the hardware can define the meaning and use of what they get more freely. Whether a school wants to use some refurbished computers as workstations in a lab, or as servers for their eLearning initiatives, or as data acquisition devices in some science project, that choice is not foreclosed in any manner by the software. This is a discourse of expressive actions that justify the practice of reusing waste as an education enabler. FLOSS allows organisations like Free Geek to act as neutral experts in a discourse balancing needs-for and surplus-of computer hardware, not dissimilar to the role experts ought to play in deliberative exercises. It is not that that they do not influence those they interact with. Indeed, the opinion and explanations of experts in deliberative exercises ought to influence the judgements of deliberators, but it should not impose a pre-established perspective. A nuclear physics expert contributing to a deliberative exercise on the building of a new power plant should not try to show that being worried about a highly improbable catastrophic event is irrational, but merely explain the probability of such a catastrophic event. It is up to the deliberators to decide if worrying about it is justified or

52 See <http://www.freegeek.org/> (Retrieved 30th August 2010).

53 See <http://www.ubuntu.com/> (Retrieved 30th August 2010).

not. Similarly the role of an organisation working for redistribution of technological resources (like computer hardware) should not imply a particular function for any particular piece of hardware if this can be avoided.⁵⁴ The use of FLOSS, because it is an MBDG, permits the flexibility of appropriation and thus of meaning, which in turn, fosters a role for the expert (the Free Geeks) which is not patronising, and thus favours informed deliberation and equity.

A Router is a Computer

A similar mechanism, where the use of FLOSS opens up the possibility for interpretation of artifacts, and implicitly promotes a more equitable, provisional, accountable and therefore democratic and discursive conception of cyberspace, is the use of Linux based software on computer appliances (see Lehrbaum, 2003, for examples of such devices). Several companies have introduced devices which are meant to work as appliances. The user just plugs them in and with minimal intervention these devices 'just work'. (cf. Mohamed, 2007). Things like home routers, Wi-Fi access points, disk and printer sharing devices, but also digital cameras and game consoles, are such appliances. Most of these devices are in fact general purpose computers, sometimes with the addition of some specialised hardware. What turns them into an appliance, such as a home network router, is the packaging and the software. Some of these devices already use FLOSS. Since Linux is licensed under the terms of the GNU General Public Licence (GPL)⁵⁵ the producers of these devices had to leave their devices easily modifiable on the software side by users. Probably the most notable instance of this was the WRT54G product by Linksys. This possibility for reinterpretation of the device led to the emergence of a community⁵⁶ (of geeks and hackers) who not only try to optimize the software that runs on these tiny cheap devices, but also experiment with the wildest and most imaginative uses that could be extracted from them.

Today there are several appliances that can be used beyond their designers intentions by replacing the provided software with alternatives from the community. Smart hackers have often found ways to put FLOSS on devices which are designed to specifically prevent the use of software not approved by the manufacturer.⁵⁷ Certain entry level models of digital cameras made by Canon can have their performance pushed well beyond that of professional grade cameras with the use of free software—The Canon Hack Development Kit (CHDK).⁵⁸ As if to assert the expressive potential of technical subversion this software also includes games such

54 Note that pre-installed free software can be disposed of and replaced with alternative solutions at no cost. Disposing of freshly installed commercial software always implies that, however little has been paid for that software, money has been wasted. This point illustrates how the cost free nature of FLOSS is not completely distinct from its other characteristics, as some proponents of OSS hold.

55 See <http://www.gnu.org/licenses/gpl.html>

56 See <http://openwrt.org/> and <http://www.wi-fiplanet.com/tutorials/article.php/3562391/The-Open-Source-WRT54G-Story.htm> for more about the technology and the community (All retrieved 30th August 2010).

57 e.g. the iPod, the iPhone, the Xbox and the PlayStation have all been unlocked. In fact without putting unofficial firmware on an iPod, it cannot play back non-proprietary lossless audio formats (see <http://www.rockbox.org/> Retrieved 11th Oct. 2010). Today, whenever a new system based on a generic computer hits the market, the hacker sub-culture always awaits the news that the device has been unjailed i.e. that a way has been found for users to put their own software on the device. This is typically followed by updated versions from the manufacturer to block these holes, which are invariably met with more determined hacking efforts. Instances where companies have, like Linksys, embraced the hacker sub-culture, are rare. The newest models by Linksys, no longer officially support FLOSS. The tragicomic repetition of the lock-down by corporations followed by the hacking open by the users is a cycle that corroborates Feenberg's notion that any technology is open to some level of subversion.

58 See <http://chdk.wikia.com/wiki/CHDK> (Retrieved 30th August 2010).

as tic-tac-toe that you can play on your digital camera. No instrumental justification can be imagined for such a technical undertaking. Why would developers invest time in such an apparently pointless exercise? Irrespective of the why, such exploits express the opening up of possibilities for action on behalf of the users who subvert digital technologies.

One might object that the ability to play tic-tac-toe on a digital camera does not in any way improve the democratic life of people. But that is not the point being made here. Just as the use of Ubuntu on refurbished hardware concurs with the aims and purposes of “Free Geek”, the principles and norms which guide the users of Internet routers and digital cameras to push the limit of their imagination and find new interpretations of that technology, this pre-disposition to appropriation and subversion of technologies, shares much with the underlying principles of deliberative democracy. That said, this only implies that those who are already familiar with MBDGs are already pre-disposed towards deliberation and democracy. Most users are attracted to such ‘hacks’ or to FLOSS for much more pragmatic reasons, reasons of efficiency, economy and convenience. The fact of the matter is that these technologies are best exploited, in terms of efficiency, economy and convenience, when a user becomes an active member of the supporting community. The example of Wikipedia above should make it clear that joining such a community requires one to adhere, or align themselves to some degree, to the fundamental ideals of such a community. Therefore, even if ostensibly individuals might choose MDBG related technologies for purely pragmatic reasons, their commitment to the technology is implicitly connected to a shift in their moral framework, which is demanded for the maximal exploitation of MBDGs. For example, when a photographer comes to value the benefits afforded by the CHDK to his work, he/she will most likely also become an active member of its community of production in order to draw maximum benefit from the technology. In this manner an affinity to its ideological framework, which is fundamentally discursive, will be nurtured in that photographer.

Help!

The significant value attached to civility, publicity, and communitarian spirit in relation to the use of FLOSS is probably best exposed in the way users of FLOSS are provided with technical support. The main avenue for obtaining support with FLOSS is the online forum. There are companies which provide commercial support contracts for FLOSS solutions, and there are many user support forums for non FLOSS, but forums, mailing lists and chat rooms are the primary user support structures for FLOSS users. Other forms of software typically include, or offer as an additional service, some form of support from the producer.

User support forums are by their very nature communitarian efforts. That these are the primary source of help, endorsed as such by the producers of the technology, highlights the discursive penchant of the communities surrounding FLOSS. Other forms of help for a user are the FAQ (Frequently Asked Questions) and the Howto. While technical documentation is usually written by programmers of FLOSS themselves, user manuals, FAQs and Howtos tend to be written by independent volunteer third parties. It is interesting to note how the narrative form of a document like a Howto is that of an advanced user, one familiar with the workings of the technology, describing how to solve specific problems, or achieve a variety of ends using the relevant software.⁵⁹ These documents can be considered a response to the demands for explanation from the voices on forums by a highly knowledgeable group of users. Often

⁵⁹ The Linux Documentation Project has a large collection of such documents. See <http://tldp.org/> (Retrieved 11th Oct. 2010).

FAQs are explicitly such responses. That several FLOSS related FAQs also include answers to such questions as how the name of some software ought to be pronounced, as well as the inclusion of humour in such documents, indicates that the community often breeches the aesthetic/functional divide that is a hallmark of a technical and expert culture.

The user support infrastructure of FLOSS resembles a community meeting where people share problems, and combine forces to come up with solutions. Often the forums end up with a number of people voicing frustration at a similar set of problems, until a couple of experts provide simple, step-by-step solutions. While this is not really collaborative solution building, it does involve a pool of people with technical solutions distributing the load of responding to a community's needs, and in the process generating a document that records the problem and its solution for the future (these forums are mostly publicly accessible and archived). This is to be contrasted with the customer support experience of a commercial and more conventional nature. This is typically personal, based on the notion that the producer of the technology has knowledge that is made available to a consumer. Most importantly, the support provided is never open to scrutiny by the user community. To be fair, today several community based forums for user support of commercial software are officially supported by the developers of that software. Where such forums are publicly accessible, and controlled by the community, they too are MBDGs.

The Browser and the Biro

Imagine a time before office computers. John and Jane work for two different companies in similar roles which include substantial writing duties. Both companies provide standard writing tools to their employees, e.g. black Biros. John's company allows employees some latitude in how they carry out their work. Employees can use their own writing tools. In fact if John's handwriting is neater when he uses a fountain pen, he is encouraged to do so. Jane on the other hand, has to follow strict corporate policy and only use the devices provided by the company. If every one would use their own writing equipment the company fears there would be havoc, and after all the company spends substantial resources in selecting the right tool for the job. Now, while it is easy to see that John works in a much freer environment than Jane, one cannot automatically conclude that John's company is better or more democratic. But let us assume that the policy on the kind of writing implement that employees may use reflects the general approach of the respective companies towards information technology (writ large to include writing tools). Imagine both companies engage external consultants to perform a deliberative exercise with employees to find out how each company can be made better. It would not be surprising in the least if John's company would fare better on the criteria for proper deliberation discussed in the first chapter.

Now fast forward these two companies to today. The bread and butter tools of today's office worker include the web browser. Yet while today most organisations allow their employees to use whichever pen they like, this is not so for web browsers. Of course there are several technical arguments that can be made as to why an organisation needs to impose a uniform technical choice on its employees. But when a tool is such an integral part of one's daily work it is not unusual to allow employees some discretion. It is not uncommon for doctors to use their personal favourite brand of stethoscope, not the one provided to them by the hospital, and manual labourers also tend to have their own personalised set of hand tools. In most fields, the people on the job are trusted with being able to make the best judgement as to which is the most adequate tool for them. Yet this does not apply to software. Managing the intellectual property implications of commercial software would make such worker discretion

too expensive. The use of FLOSS, because it is appropriable by its users, would permit a re-balancing of this situation at no additional expense. A work force that is responsible for its own choice of tools would need to be able to justify that choice, minimally to oneself, probably to peers too. It is this capacity to justify one's technical choices in response to peer's challenges that would enhance the democratic potential of that same work force.

Fear of the Fork

Sometimes the only thing that ensures that the leadership of a country respects the will of the people is the threat of a revolution. Yet, despite much talk of revolution, and discontent with leaderships, few such threats are actually credible. Revolutions are bloody and expensive. It is only under extreme circumstances that individuals come to perceive the potential loss of property or life as worthwhile for their own and their communities' benefit. Now imagine a world in which revolutions are not bloody at all, and their only cost is the time and effort of those involved, i.e. they have minimal material costs. In such hypothetical circumstances the threat of a revolution would be a real instigation for the governing elite to ensure they respect the will of the people. In other words, if the only significant cost of a revolution would be in terms of effort, the threat of revolution would act as a safeguard of democracy. I believe that such a mechanism can be seen in operation in the world of FLOSS.

The equivalent of a revolution in software is a called a fork. "[A] project fork happens when developers take a legal copy of source code from one software package and start independent development on it, creating a distinct piece of software. Free and open source software is that which, by definition, may be forked from the original development team without prior permission without violating any copyright law" (Wikipedia contributors, 2010b). Forks are not an uncommon occurrence but are not as frequent as some might expect them to be (Moen, 1999). Moen argues that forks are infrequent because of the high cost they impose. With the cost of hardware and bandwidth as low as it is today in industrialised countries, even a small splinter group of a software development community is capable of incurring the cost of material resources needed for a fork. The critical cost is human resources. If the split in the community is not rationally justified the cost for the splinter group will indeed be high. If the fork is justified, the redistribution of human resources is so fast and efficient that any new contributors attracted to the project because of more favourable conditions will more than make up for the losses. Moreover the improved performance of the community under the new favourable conditions will also justify the cost in lost human resources. So why do only a few forks occur?

Just like national leaders, the leaders of FLOSS projects generally ignore most threats or attempts at forking as not credible (Wheeler, 2007, sec. A.6). The major difference is that the evaluation cannot be based on the resources available to the dissenters as opposed to those available to the establishment. The reason that minor forks can be ignored is based on what justifications can be provided for a fork. If, as in the case of X.Org,⁶⁰ the reason to fork is based on the refusal of the leadership to sustain a communitarian model, the fork will succeed, and the original leadership is discredited (Wheeler, 2010 appx. A). In other instances, the leadership will find itself having to revise its position, and sometimes this leads to forks merging back together, as happened, for example, in the case of the Compiz and Beryl projects.⁶¹

60 The X.Org project provides Open Source Software that give graphical user interface capabilities to an operating system. See <http://www.x.org/wiki/> (Retrieved 11th Oct. 2010).

61 Compiz is Open Source Software that provides accelerated 3D display features to the graphical → p.85

I believe that large FLOSS projects manage to avoid most significant forks because their leadership has developed the capability to meet the needs and demands of the community. This is not achieved by pleasing the community with occasional treats, nor with a carrot and stick approach. That would not work, since any individual is free to copy all the available code. The leadership of such projects is capable of justifying, through argument, its unpopular choices. Where the counter justifications from a splinter group turn out to be irrefutable, the leadership will eventually consent to their demands. While the leadership style of somebody like Linus Torvalds is more appropriately described as dictatorial, rather than democratic (Hamm, 2004), the Linux Kernel development mailing list⁶² is ripe with instances of deliberative style demands for justification and responses. Sometimes these exchanges are layered with abundant incivility,⁶³ but the more common style of discussion would conform (or come pretty close) to the criteria of rational discourse. To get a feel for this form of deliberation of technical matters, I recommend following Kerneltrap,⁶⁴ a service which provides highlights from the Linux Kernel development mailing lists.

To sum up, the difference between FLOSS and commercial software in terms of the meaning of technologies, and how they influence one's understanding of the world and of the self, results in a difference in the balance of powers. This is not to say that the use of FLOSS is in and of itself a democratic action, nor that the use of non-FLOSS software is anti-democratic. The point being made is that the use and development of FLOSS benefits from and bolsters the character traits that are valuable to civic virtue in a discursive context. Equal consideration of all persons, ability to conceive alternative norms, mutual respect, civility and skill in providing and understanding rational justification are all character traits that go along with the use and production of convivial software, as well as with deliberative practice. Non mutual benefit software does not necessarily impede the development of such character traits, but because it is non-appropriable, and demands an unbalanced power relationship, it is biased away from such traits.

Open Access Academic Journals

I have pointed out in the first chapter that it is difficult to determine if an Open Access article is an MBDG because Open Access means too many different things (MacCallum, 2007). So called "gold" Open Access (Harnad et al., 2004), where articles would conform with the Bethesda Statement on Open Access Publishing (Suber, 2003), is the kind which would most obviously meet the criteria of MBDGs. According to the Bethesda Statement on Open Access Publishing an Open Access publication is one that meets two conditions:

1. *The author(s) and copyright holder(s) grant(s) to all users a free, irrevocable, worldwide, perpetual right of access to, and a license to copy, use, distribute, transmit and display the work publicly and to make and distribute derivative works, in any digital medium for any responsible purpose, subject to proper attribution of authorship, as well as the right to make small numbers of printed copies for their personal use.*

desktop environment of a system. Beryl was a fork from Compiz that can be credited with pushing the developers of Compiz to manage the project in a more communitarian style. The two projects merged after a year of separate development. See <http://www.compiz.org/> (Retrieved 11th Oct. 2010).

62 See <http://lkml.org/> (Retrieved 11th Oct. 2010).

63 See <http://kerneltrap.org/node/14008> for a particularly vivid example (Retrieved 11th Oct. 2010).

64 See <http://kerneltrap.org/> (Retrieved 11th Oct. 2010).

2. *A complete version of the work and all supplemental materials, including a copy of the permission as stated above, in a suitable standard electronic format is deposited immediately upon initial publication in at least one online repository that is supported by an academic institution, scholarly society, government agency, or other well-established organization that seeks to enable open access, unrestricted distribution, interoperability, and long-term archiving.*

(Suber, 2003)

It is clear from the statement itself that appropriation is in no way curtailed, rather it is encouraged by explicitly allowing derivative works. The second condition is one of the most explicit way in which MBDGs' value for posterity can be achieved. The only limitations to how Open Access can be appropriated are the requirements for proper attribution of authorship and that of responsible use. These are hardly limitations at all. The sort of appropriations which would not be possible by the requirement of attribution of authorship (a common requirement to most MBDGs) are rare in general, and difficult to imagine in the case of scientific articles. Irresponsible use of scientific knowledge should be prohibited on moral grounds generally, therefore it is not the requirement stated here that would limit such malicious appropriation.

This kind of Open Access is important for the scientific community itself. For the general public the benefits go beyond the simple notion that science paid for from taxes ought to be available to the public. Within a deliberative conception of democracy, especially in view of how in today's world technically and scientifically informed common action forms such a significant part of political life, experts have a very important role. They are not to take decisions on behalf of the public, but to guide and inform the debate on technical matters. It thus becomes essential that the public, with help from experts, have more than mere access to scientific research. Science needs to be appropriable. For example, the inherent right to translate MBDG scientific articles (and to re-publish translations) makes the premise of equality with regards to making properly informed arguments more feasible.

If decisions are to be taken on the basis of better argument, it is important that one is not able to hide behind a 'veil of science'. That published articles are available to the general public, irrespective of whether the public does go to the original sources, increases the accountability of the scientist and of his/her argument. By opening an argument and the facts upon which it is based to public scrutiny that argument becomes stronger. In practice, the public tends to depend on some form of science and technology journalism for its scientific information. Unfortunately reporters often omit to refer to the original scientific publications their stories are based upon. Open Access makes it possible for journalists to perform a supervisory role upon the claims of science, very much like the free press is considered a guardian of democracy for the supervisory role it has over politicians.⁶⁵

Popper's (2002) and Kuhn's (1996) accounts of the scientific method share an important basic principle with deliberation: provisionality. Yet, since the scientific community is shrouded in

⁶⁵ A recent example of bad scientific journalism is the story that emerged out of research on the role the protein ovocledidin-17 plays in eggshell formation. The story made the headlines as one in which scientists had found the answer to the question: Which came first, the chicken or the egg? (The Sun, 2010). It is interesting that the original scientific article is not referenced and is not available as Open Access. Also very interesting is the cynical and sarcastic reaction to this news by readers of Slashdot, a blog frequented by FLOSS community members, where one of the first comments provided a link to the original article.

an air of elitism, scientific knowledge, (or to put it in a journalistic style, “what scientists have shown ...”) tends to be perceived as immutable and absolute truth by non-scientists. The potential appropriability of scientific knowledge by any individual helps break down the elitism of science.

While there is not the space to further elaborate on the value of mutual benefit Open Access for democracy in cyberspace, it would be interesting to compare the use of empirical evidence in making choices within FLOSS development (such as the use of performance analysis of alternative algorithms), or the use of published scientific data in Wikipedia for resolving editorial disputes, against the use of published science in public debates about national legislation. I predict that the less deliberative the legislation process the more it will depend on non-appropriable scientific publishing, such as commissioned reports with limited circulation. Also, an exploration for occurrence of subversion of technology within the scientific community would inform the evaluation of scientific practice in terms of democracy.

Public Data and Folksonomies

The ontology of folksonomies may be rather complicated to discern, which makes it hard to say if a specific folksonomy, or folksonomies in general, are MBDGs. On the other hand the data set which represents a folksonomy, the actual database that contains the tags, URLs and other data, is easier to scrutinise. Let us assume that there is such a dataset that meets the criteria for being an MBDG.⁶⁶ How does its use engender deliberative virtue? Is not tagging content just like voting, whereby the majority opinion rules?

Whenever one tags some content, that person is engaging what is, albeit implicitly, a community of production for the data set. Unlike voting, where one has a limited set of options offered by the authorities, ‘digging’ content is unbounded. Any content may be tagged, and any tag may be used. By using statistical analysis of such data sets (Echarte, Astrain, Córdoba, & Villadangos, 2009) one could extract a classification that reflects the public world-view. Using such classification upon public data sets, such as those the British government makes available through its data.gov.uk initiative, would allow us to frame public data in a manner that better reflects the popular will.

It is clear that there are emerging practices and entities whose nature is not easy to comprehend. Rather than suspend judgement upon these, I propose that even if a digital entity does not quite conform properly to the notion of an MBDG, as long as it approaches that mode of being it can be assumed to have some pro-democratic value. When a novel digital entity resembles an MBDG it might be only implicitly facilitating democratic discourse. At least when compared to other digital products which explicitly inhibit appropriation, such emergent digital goods should be considered as favourable to democracy.

⁶⁶ Digg (<http://digg.com/>) is a website for community based tagging of any online content. The data it collects from users is dedicated to the public domain (<http://about.digg.com/terms-use>). It runs on FLOSS (<http://about.digg.com/blog/digg-open-source>) and also provides an open Application Programming Interface that allows anyone to make free use of the dataset (<http://developers.new.digg.com/>). Barring the fact that its databases cannot be duplicated by third parties (one has to keep in mind the practical difficulties of replication large amounts of data); and noting that the company behind the service presents itself as community oriented as well as trying to facilitate the use of its data as much as possible; this dataset comes close to being an MBDG. (All links retrieved 11th Oct. 2010).

Conclusion

In this chapter I have given a brief look at some MBDGs in an attempt to highlight their democratic potential. I have focused on the production of MBDGs which are very much community driven. Other forms of appropriation were also touched upon lightly. The world of MBDGs is much richer and larger than the very few examples I have looked at. Wikipedia and FLOSS were my focus because they have an iconic standing amongst efforts variously labelled as 'Open', 'Free', 'Libre', 'community-driven' or 'peer-based'. The approach which these projects follow is spilling over into all kinds of activity on and off line. Open Hardware, Open Architecture and other ideas are being put forward as novel ways of approaching those domains of life. Open Access scientific publication is also very important in view of how central scientific knowledge is to our present way of life. In the world of art, digital art is also challenging many established ideas, often through collaborative efforts and the use of digital technology as a medium, rather than just a tool. The list goes on.

So, even if the examples given here concern only few MBDGs, and even if those were not examined in too much depth, I believe that the point is sufficiently made. Those responsible for technological choice, who also want their choices to be in favour of democracy, need to have a good look at MBDGs. The way technological goods are developed and appropriated by users ought to be an important criterion of choice alongside cost/benefit considerations.

By merely scratching at the surface of some MBDGs I have revealed an impressive democratic dynamism, even if occasionally immature or deployed in crude vocabulary. The relevance of the deliberative mode of thinking for an information society also becomes clear, as it provides the conceptual tools to uncover the democratic potential of activities such as those explored here. Moreover there is a lot about netizens' understanding of democracy that can be revealed once the technology-politics divide is overcome. Considering that so many European citizens are also netizens, I wonder what an extensive examination of more MBDGs would teach us about the problem of democratic deficit.

— 5 —

Conclusion

Those of us who live in developed western societies are, by and large, lucky enough to enjoy living in a democracy. We also live in societies where ICT is ubiquitous. The leaders of our communities, our politicians, push forward the idea of an information society and advocate the increased use and development of ICT as solutions to many of our ills, be they economical or otherwise. At the same time, they also advocate the need for a deepening and spreading of democracy. In such a context substantial resources are expended on activities and initiatives relating to eDemocracy—the use of ICT to improve our democratic practices. Yet, even as ICT penetration continues to grow, and the possibilities for collaboration ICT offers increase, there has not been any palpable change in the quality of our democracies. Within western political set-ups there is a problem of democratic deficit, i.e. a disconnect between the governed and the leadership, which up to now eDemocracy initiatives have failed to resolve. If this problem is partially due to individuals lacking democratic capability, then it is poignant to ask **what kind of ICTs can, through use, nurture the virtue of civic duty (the capacity for democratic life) for their users?**

In addressing this question I have proposed that, when democracy is understood in terms of the deliberative theories of democracy, MBDGs hold a democratic added value, and it is technologies that are MBDGs themselves, or those that enable their existence, that can nurture the virtue of civic duty in their users. This answer takes the form of three steps.

First, digital technologies which possess democratic potential need to be discerned from the myriad ICTs available. The notion of MBDGs serves as a guide in this purpose. MBDGs are those digital goods which are most appropriable by their users. This means that a user can make that good one's own, and put something of him/herself in that good for the benefit of others. The creation, use, and exploitation of MBDGs requires the use of convivial tools, tools which do not restrict the possibilities of action for their user, but rather expand them. Software convivial tools are also themselves MBDGs.

Two other ways of discerning ICTs have substantial overlap with MBDGs and are closely related. One is so called Open Source technology such as FLOSS. The defining characteristics of Open Source technology are the availability of the source code and their collaborative production methods. The other categorisation is the commons which discerns digital goods on their status at law in terms of intellectual property. Very roughly, MBDGs are a subset of the commons because not every digital good in the commons is modifiable (e.g. those with the 'No Derivatives' clause in Creative Commons licences), and appropriation demands that there are no legal restrictions to modification. At the same time MBDGs are a super-set of Open Source technologies as they include digital goods which are not collaboratively produced or which have no equivalent of a source code (e.g. digital artworks created by a lone artist). The notion of MBDG is based on the *telos* of the thing rather than its *genesis*, not on how it comes to be but on what individuals, and communities, can do with it, and how they can shape themselves through its use. The notion of MBDG as presented in the first chapter serves to group technologies which are phenomenologically similar but technically distinct⁶⁷ and to provide a vocabulary for relating digital goods to notions of democracy.

The second step to answering the main question addressed by this thesis is to clarify the notion of democracy to be used. The problem here is that democracy means many different things. In discussing democracy in relation to ICT one needs to make use of a theory of

⁶⁷ Open Source Software, Open Access journals, Wikipedia, mashups etc. all share a certain feel of 'openness', or 'freedom', but are technically very different, so what makes them similar? The notion of MBDG groups together such things by their appropriability by users, whether individuals or communities.

democracy that makes sense in cyberspace. We need a conception of democracy that works in cyberspace for three reasons: 1) Cyberspace needs governance, and we want it governed democratically; 2) ICT can, in being used, teach democratic virtue, if the technology reflects those virtues; and 3) if we want to spread democracy, in view of the argument that technologies modulate our morals, it is important that we make sure that the most widespread technologies reflect democratic values. Considering that the technology under review is that of information and communication it is reasonable to look for a conception of democracy which is based on theories of communication. These are the deliberative theories of democracy.

Of the various conceptions of deliberative democracy, it is the one presented by John S. Dryzek that can provide a framework that is most meaningful in the context of cyberspace. I have argued that for the purposes of democracy it would be advantageous to conceive cyberspace in a manner congruent to the way people who have a life online understand it—as an ‘outer space’ or external jurisdiction. If that conception of cyberspace is accepted, then a notion of deliberative democracy that does not require classical notions of borders and citizenship, such as that put forward by Dryzek for the democratization of international politics, is most adequate for application to cyberspace.

The last step involves bringing the notion of MBDG and that of deliberative democracy together and explain how ICT, through use, promotes the virtue of civic duty in people. Since the notion of democracy to be used is that of **deliberative** democracy, a mechanism which would allow MBDGs to nurture the virtues required for deliberation is proposed. First and foremost, the instrumentalist view of technology needs to be abandoned. Technologies and politics do affect one another, technology is not morally neutral. The most useful way of conceptualising this interaction is in terms of the co-constitution of humans and technologies based on mediation. Only after having argued that technologies can modulate morality, understood as constitution of the self, do I move forward to suggest how ICT can, through use, shape users towards deliberative virtues.

Technological subversion is a means of democratisation of technology. When users of a technology implement alternative uses or meanings for a technology, different from the intended use provided by the designers of that technology, they are subverting it. No complex system is completely resistant to subversion, but the nature of digital technology, its flexibility and ubiquity, invites subversion more than most technologies. Digital subversion is a form of appropriation of digital goods and technologies. It shifts the meaning of those goods and technologies. It shares the most basic ideas with a discursive notion of democracy: both affect the world through communication; discursivity demands equality of power among deliberators, and ICT provides all users the same tool-kit for manipulating data; and subversion involves a constant opposition to the *status quo*, which reflects the principle of provisionality in deliberative democracy.

MBDGs, by inviting their own subversive re-appropriation, are digital goods that, in use, nurture the same family of virtues required for democratic deliberative practice. Using MBDGs brings forth in the user a discursive attitude, and in order to exploit MBDGs one has to shape themselves towards discursive rationality.

Limitations of the Study

This attempt at tackling the issue of the role of ICT towards improving democracy brings together three large and complex fields of study, two of which are relatively new. In the first

instance we are here concerned with the philosophy of ICT and the nature of the digital. The apparent simplicity of all that is digital being made up of ones and zeros belies the real complexity of capturing what one is actually talking about when discussing digital entities. Several assumptions about the ontology of the digital are implicit, and conceptual leaps have been made where it was felt that these would not be detrimental to the general argument.

The second relatively new field of inquiry brought into play is that of ethics and politics of technology. Only the briefest of summaries of the most significant points have been provided. Many of the arguments rely on acceptance of the positions of other authors, particularly in relation to overcoming deterministic or instrumental conceptions of technology, as well as the need to move beyond classical subject-object division and consequentialist or rule-based ethical evaluation of technology. While these positions have been very strongly argued for by others, they still cannot be considered as the mainstream vision of ethics and politics of technology.

The third topic, that of deliberative democracy, while probably more well established and recognised as a field of study, is not the default conception of democracy that one might expect to be found amongst, say, computer scientists developing the technologies of concern to this thesis. Moreover, deliberative democracy is extremely varied itself, and pre-supposes a theory of rationality and argument, which is in turn a vast area of inquiry. In short, in my attempt to bridge the field of ICT with deliberative democracy through the philosophy of technology I risk not having done justice to any one of those fields.

Additionally my claims would benefit from additional supporting evidence. While I review some examples as a means of corroborating my arguments, much more empirical evidence is needed to demonstrate conclusively that my principal claim holds true. This is due to two factors. The first is a pragmatic limitation of time and space. The second is that some of the practices that could be investigated for supporting evidence are themselves ill-defined. Before one can investigate if a folksonomy is an MBDG it would be useful to have a clearer understanding of its ontology. There is also little empirical research on the behaviour of online communities, partly due to the fact that they have not existed very long.

One other limitation is that what is under consideration are phenomena that are hard, if not impossible to measure. In principle an objective metric of how democratic a technology is, is contradictory to the whole notion of deliberative democracy.

Further Research

Most of the limitations expressed above can be overcome with further research. It is recommended to shore up the notion of MBDG with further research into which technologies meet the criteria of appropriability for being MBDGs. It would be interesting to see to what extent online technologies other than those mentioned fulfil these conditions, and how far is their propensity for benefiting posterity actualised. Additionally a thorough exploration of non-MBDGs ought to reveal commonalities in terms of non-appropriability. Another avenue of research would take the concept of mutual benefit on the basis of appropriation and convivial tools and explore if it is generalisable beyond the present context of digital technology. Other non-digital things, such as genome sequences or built environments, might also be interpreted in terms of mutual benefit, opening new avenues for the political analysis of their use.

In the domain of deliberative democracy, the notion of democracy for cyberspace presented is far from complete. The concepts which make transposition of the notion of democracy to cyberspace difficult (borders, citizenship, and establishment) are difficulties which one can expect to find in the application of deliberative democracy theories to any context other than that of the nation state. A theory of democracy that permits substantial latitude in the figuration of the *demos* would be very useful generally. Even if one disagrees with the proposal put forward of considering cyberspace as an 'outer space', a fully expanded theory of deliberative democracy that works well for cyberspace as 'outer space' would be worth developing, for there are other conceivable 'outer spaces' one might want to democratise, such as supra-national arrangements.

Finally, substantial anthropological or sociological and historical research into the communities of production of MBDGs would be most valuable in allowing a fuller analysis of how these communities express and embed the democratic potential of the technologies and the goods they revolve around. In-depth research into individual FLOSS sub-communities, or into the sub-culture of Anime Music Videos would allow one to understand how deep and/or mature the democratizing characteristics exposed in this work really are.

Practical Implications

Before concluding what is fundamentally a theoretical exploration, a few remarks on what the practical implications of the main claims presented would be for political institutions, are in order. Political institutions include such entities as the European Union, national governments, but also elements of civil society. I assume that in the same way that there is substantial consensus towards expending public resources addressing climate change partly through green technologies, there is consensus for addressing the democratic deficit partly through ICT. If the notion of democracy as deliberative democracy is accepted and the arguments presented for considering MBDGs as having potential for nurturing civic virtue through use are convincing, what measures could political institutions take?

Before trying to alter peoples behaviour and ideas, an institution ought to lead by example. To keep the climate change analogy, it is rather hypocritical of an institution like the EU to try and make member states and citizens more environmentally conscious before it goes green itself. If the offices and operations of the EU were the paragon of energy efficiency it would not only be leading by example, and generating know-how, but its demands would have much greater force. Similarly, by adopting democratically valanced ICT it would be leading by example and generating know how on democratisation. This does not imply that the EU should completely move to FLOSS for all its ICT operations. Just like in the case of environmental technology there are significant practical problems to undertaking such a change. But, minimally, just as today environmental criteria are appearing on the evaluation procedures for the acquisition and deployment of technologies, a democratic criterion ought to be included in the evaluation of information technologies.

Political institutions also generate, posses, and handle huge amounts of informational goods. These are such things as publications, raw data, records, documents, press releases, official photos, etc. It is recommended, that for the sake of nurturing democracy, as much of this material as is feasible ought to be made available in the form of MBDGs. It is clear that due to concerns of security and privacy, personal records should not be published. But it is not clear at all why the raw data of an anonymous survey conducted by some governments is not put in the public domain, or why institutions do not release health promotion publications, or policy

documents, as MBDGs. To be more explicit, all material published by public institutions ought to be available under terms more like those of Wikipedia and less like those of the European Parliament's website⁶⁸ which allows non-commercial use, but no modification.

There are at least two main ways in which political entities can affect people's behaviour: through regulation, and through funding. To address the democratic deficit through the use of MBDGs a political institution can use the market by choosing how public funds are spent. When funding scientific research, public funds should be tied to the condition that any article published on the basis of publicly funded research has to be made available as Open Access. Additionally any software developed through public funding should be FLOSS. Media, art, and other creative digital content should also be publicly funded only if it would become part of the commons. This would not only generate substantially more MBDGs, but would encourage those wishing to access public funds to engage MBDG producing communities.

With regards to regulation I merely point out that several authors, such as Koepsell and Lessig, have argued extensively for the need to re-evaluate the whole of the current intellectual property legislative framework. While Koepsell argues from the point of view of the need for a consistent ontological framework for legislation, Lessig argues from the perspective of resource management, and sustaining creativity. Considering that intellectual property is probably the most significant impediment to the appropriation of potential MBDGs, I add that intellectual property law also needs to be revisited for the sake of enhancing democratic practice.

Finally, it is important to keep in mind that it is not exclusively through use that ICT can help improve our democratic practice. I recommend that political institutions can learn a lot about democracy from cyberspace. It is worthwhile having a good look at some of the online activity which is most promisingly democratic to see if there are any practices or ideas that might be adaptable for use in non-cyberspace contexts, thus improving democracy on the ground. A simple example would be the possibility of using wiki like technology for drafting legislation, so that the public has a historical record of how the specific wording came to be.

I conclude with a radical proposal. Even if I have presented Wikipedia as an exemplar MBDG with core deliberative democratic principles, the community sometimes needs to resort to a vote. The voting system used by Wikipedia is the Schulze method.⁶⁹ This method is one of very few voting systems capable of consistently producing an unambiguous fair outcome. The software for counting votes according to this method, which would be very laborious by hand, is (relatively) simple and readily available. Several other MBDG communities of production have adopted this electoral method because it is considered the fairest available. I propose that political institutions should engage such communities of production to learn about their electoral practices with the prospect of deploying such electoral methods in non-cyberspace contexts. Of course such a proposal, to change voting systems simply because the alternative can be rationally justified as fairer, is preposterous to real world politics. Perhaps then, it is time for the real world to consider imitating some of the better traits of cyberspace. An ever increasing number of online communities are busy deliberating their way into the future, without pausing to ponder if their community ought to be called a democracy. Perhaps, we need to shape our own politics on theirs.

68 See http://www.europarl.europa.eu/tools/disclaimer/default_en.htm#copyright (Retrieved 11th Oct. 2010).

69 See http://en.wikipedia.org/wiki/Schulze_method for more information on this electoral method. (Retrieved 11th Oct. 2010).

Bibliography & References

- Alexa Internet, Inc. (2010, August 30). Wikipedia.org Site Info. *Alexa*. Retrieved August 31, 2010, from <http://www.alexa.com/siteinfo/wikipedia.org>
- AnimeMusicVideos.Org. (2010, August 3). Anime Music Videos .Org. Retrieved August 3, 2010, from <http://www.animemusicvideos.org/home/home.php>
- Axelrod, R., & Hamilton, W. (1981). The evolution of cooperation. *Science*, 211(4489), 1390-1396. doi:10.1126/science.7466396
- Back, A. (2003, November 24). perl RSA "munitions" T-Shirt homepage. *perl RSA "munitions" T-Shirt homepage*. Retrieved June 4, 2010, from <http://www.cypherspace.org/adam/shirt/>
- Bakardjieva, M., & Feenberg, A. (2002). Community Technology and Democratic Rationalization. *The Information Society: An International Journal*, 18(3), 181. doi:10.1080/01972240290074940
- Barnett, E. (2010, April 19). Volcanic ash cloud: Trapped Norwegian PM 'ran country on iPad'. *Telegraph.co.uk*. Retrieved from <http://www.telegraph.co.uk/technology/apple/7606722/Volcanic-ash-cloud-Trapped-Norwegian-PM-ran-country-on-iPad.html>
- Benkler, Y., & Nissenbaum, H. (2006). Commons-based Peer Production and Virtue. *Journal of Political Philosophy*, 14(4), 394-419. doi:10.1111/j.1467-9760.2006.00235.x
- Ben-Ner, A., & Putterman, L. (2000). On some implications of evolutionary psychology for the study of preferences and institutions. *Journal of Economic Behavior & Organization*, 43(1), 91-99. doi:10.1016/S0167-2681(00)00110-4
- Berger, J. A., & Milkman, K. L. (2009). Social Transmission, Emotion, and the Virality of Online Content. *SSRN eLibrary*. Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1528077
- Berger, J. A., & Milkman, K. L. (n.d.). Virality: The Science of Sharing and the Sharing of Science. Retrieved from http://www.rhsmith.umd.edu/marketing/pdfs_docs/2009%20Marketing%20Camp/BergerViralityTheScienceofSharing.pdf
- Berger, L. (2009). The Authentic Amateur and the Democracy of Collecting Photographs. *Photography and Culture*, 2(1), 31-50. doi:10.2752/175145209X419390
- Bergquist, M., & Ljungberg, J. (2001). The power of gifts: organizing social relationships in open source communities. *Information Systems Journal*, 11(4), 305-320. doi:10.1111/j.1365-2575.2001.00111.x
- Black, J. (2005). Impossibility of Technology-Based DRM and a Modest Suggestion, The. *Journal on Telecommunications & High Technology Law*, 3(2), 387-396.
- Bohman, J. (2004). Expanding dialogue: The Internet, the public sphere and prospects for transnational democracy. In J. Habermas, N. Crossley, & J. M. Roberts (Eds.), *After Habermas: new perspectives on the public sphere* (pp. 131-155). Wiley-Blackwell.
- Briggie, A. (2008). Real friends: how the Internet can foster friendship. *Ethics and Information Technology*, 10(1), 71-79. doi:10.1007/s10676-008-9160-z
- Burgess, J. (2006). Hearing Ordinary Voices: Cultural Studies, Vernacular Creativity and Digital Storytelling. *Continuum: Journal of Media & Cultural Studies*, 20(2), 201. doi:10.1080/10304310600641737
- Capurro, R. (1996). Information Technology and Technologies of the Self. *Journal of Information Ethics*, 5(2), 19-28.

- Dangwal, R., & Kapur, P. (2009). Social networking effect at ?HiWEL? kiosks amongst children. *Multicultural Education & Technology Journal*, 3(4), 290-305. doi:10.1108/17504970911004291
- Dangwal, R., & Kapur, P. (2009b). Learning through teaching: Peer-mediated instruction in minimally invasive education. *British Journal of Educational Technology*, 40(1), 5-22. doi:10.1111/j.1467-8535.2008.00863.x
- DeNardis, L. (2010). The Emerging Field of Internet Governance. *Yale Information Society Project Working Paper Series*. Retrieved from <http://ssrn.com/abstract=1678343>
- DiBona, C., Ockman, S., Stone, M., Behlendorf, B., Bradner, S., Hamerly, J., McKusick, K., et al. (1999). *Open Sources: Voices from the Open Source Revolution* (1st ed.). O'Reilly Media.
- Dorrestijn, S. (2009, September 1). *Technical mediation in Foucault's work*. Forthcoming, University of Twente.
- Dryzek, J. S. (1994). *Discursive Democracy: Politics, Policy, and Political Science*. Cambridge University Press.
- Dryzek, J. S. (2002). *Deliberative Democracy and Beyond: Liberals, Critics, Contestations*. Oxford University Press, USA.
- Dryzek, J. S. (2005). Deliberative Democracy in Divided Societies. *Political Theory*, 33(2), 218 -242. doi:10.1177/0090591704268372
- Echarte, F., Astrain, J. J., Córdoba, A., & Villadangos, J. (2009). Folksonomy Resources as a Data Source for the Social Data in Semantic Web. In *Proceedings of the 2nd Workshop on Social Data on the Web (SDoW2009), collocated with the 8th International Semantic Web Conference (ISWC-2009)*. Presented at the Second Workshop on Social Data on the Web (SDoW2009), Washington DC, USA. Retrieved from <http://ceur-ws.org/Vol-520/paper05.pdf>
- Edgar, A. (2004). *The philosophy of Habermas*. Chesham: Acumen.
- Elgin, B., & Einhorn, B. (2006, January 12). The Great Firewall of China. *BusinessWeek: Technology*. Retrieved from http://www.businessweek.com/technology/content/jan2006/tc20060112_434051.htm
- European Commission. (2009). *Antitrust: Commission confirms sending a Statement of Objections to Microsoft on the tying of Internet Explorer to Windows*. Brussels. Retrieved from <http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/09/15>
- Feenberg, A. (1992). Subversive rationalization: Technology, power, and democracy. *Inquiry: An Interdisciplinary Journal of Philosophy*, 35(3), 301. doi:10.1080/00201749208602296
- Feenberg, A. (1999). Escaping the Iron Cage, or, Subversive Rationalization and Democratic Theory. In R. V. Schomberg (Ed.), *Democratizing Technology: theory and practice of deliberative technology policy*. International Centre for Human and Public Affairs. Retrieved from <http://www.sfu.ca/~andrewf/schom1.htm>
- Feenberg, A. (2001). Democratizing Technology: Interests, Codes, Rights. *The Journal of Ethics*, 5(2), 177-195. doi:10.1023/A:1011908323811
- Feenberg, A. (2002). *Transforming Technology: A Critical Theory Revisited* (2nd ed.). Oxford University Press, USA.
- Fishkin, J. (2009a, February 9). Democracy, Partisanship, and Deliberation. *Cato Unbound*. Retrieved September 25, 2010, from <http://www.cato-unbound.org/2009/02/09/james->

- fishkin/democracy-partisanship-and-deliberation/
- Fishkin, J. S. (2009b). *When the People Speak: Deliberative Democracy and Public Consultation*. Oxford University Press, USA.
 - Fishkin, J. S., Luskin, R. C., & Jowell, R. (2000). Deliberative polling and public consultation. *Parliamentary Affairs*, 53(4), 657.
 - Fleishman, G. (2000, December 14). Cartoon Captures Spirit of the Internet. *The New York Times*. Retrieved from <http://www.nytimes.com/2000/12/14/technology/cartoon-captures-spirit-of-the-internet.html>
 - Foucault, M. (1988). Technologies of the Self. In L. H. Martin, H. Gutman, & P. H. Hutton (Eds.), *Technologies of the self: A seminar with Michel Foucault* (pp. 16-49). Tavistock London. Retrieved from <http://foucault.info/documents/foucault.technologiesOfSelf.en.html>
 - Freeman, S. (2008). Original Position. In E. N. Zalta (Ed.), *The Stanford Encyclopedia of Philosophy* (2009th ed.). Retrieved from <http://plato.stanford.edu/entries/original-position/>
 - Fry, S. (2010, May 4). How I will vote.... *The New Adventures of Stephen Fry*. Retrieved May 4, 2010, from <http://www.stephenfry.com/2010/05/04/how-i-will-vote/>
 - Gandhi, M. (2004). *Soul Force: Gandhi's Writings on Peace*. (V. Geetha, Ed.). Tara Publishing.
 - Gintis, H., Bowles, S., Boyd, R., & Fehr, E. (2003). Explaining altruistic behavior in humans. *Evolution and Human Behavior*, 24(3), 153-172. doi:10.1016/S1090-5138(02)00157-5
 - Grimmett, J. J. (2001). *Encryption Export Controls* (CRS Report for Congress). Congressional Research Service, The Library of Congress.
 - Gutmann, A., & Thompson, D. (2002). Deliberative Democracy Beyond Process. *Journal of Political Philosophy*, 10, 153-174. doi:10.1111/1467-9760.00147
 - Gutmann, A., & Thompson, D. (2004). *Why Deliberative Democracy?* Princeton University Press.
 - Habermas, J. (1989). The Public Sphere: An Encyclopedia Article. In S. E. Bronner & D. Kellner (Eds.), *Critical theory and society: a reader* (pp. 136-142). Routledge.
 - Habermas, J. (2006). Political Communication in Media Society: Does Democracy Still Enjoy an Epistemic Dimension? The Impact of Normative Theory on Empirical Research. *Communication Theory*, 16(4), 411-426. doi:10.1111/j.1468-2885.2006.00280.x
 - Habermas, J., Crossley, N., & Roberts, J. M. (2004). *After Habermas: new perspectives on the public sphere*. Wiley-Blackwell.
 - Hacker. (2010). In *Merriam-Webster Online Dictionary*. Retrieved from <http://www.merriam-webster.com/dictionary/hacker>
 - Hamlett, P. W. (2003). Technology Theory and Deliberative Democracy. *Science Technology Human Values*, 28(1), 112-140. doi:10.1177/0162243902238498
 - Hamm, S. (2004, August 18). Linus Torvalds' Benevolent Dictatorship. *Bloomberg Businessweek*. Retrieved from http://www.businessweek.com/technology/content/aug2004/tc20040818_1593.htm
 - Harnad, S., Brody, T., Vallières, F., Carr, L., Hitchcock, S., Gingras, Y., Oppenheim, C., et al. (2004). The Access/Impact Problem and the Green and Gold Roads to Open Access. *Serials Review*, 30(4), 310-314. doi:10.1016/j.serrev.2004.09.013

- Henrich, J. (2004). Cultural group selection, coevolutionary processes and large-scale cooperation. *Journal of Economic Behavior & Organization*, 53(1), 3-35.
doi:10.1016/S0167-2681(03)00094-5
- Howe, J. (2006, June 2). Crowdsourcing: A Definition. *Crowdsourcing*. Retrieved August 31, 2010, from http://crowdsourcing.typepad.com/cs/2006/06/crowdsourcing_a.html
- Illich, I. (2001). *Tools for Conviviality*. Marion Boyars.
- Jacobsson, K. (1997). Discursive Will Formation and the Question of Legitimacy in European Politics. *Scandinavian Political Studies*, 20(1). Retrieved from <http://www.tidsskrift.dk/visning.jsp?markup=&print=no&id=95782>
- Joerges, B. (1999). Do Politics Have Artefacts? *Social Studies of Science*, 29(3), 411-431.
doi:10.2307/285411
- Keating, J. W. (1964). Sportsmanship as a Moral Category. *Ethics*, 75(1), 25-35.
- Knops, A. (2006). Delivering Deliberation's Emancipatory Potential. *Political Theory*, 34(5), 594-623. doi:10.1177/0090591706290780
- Koepsell, D. R. (2003). *The Ontology of Cyberspace*. Open Court Publishing.
- Koepsell, D. R. (2009). *Who owns you?: the corporate gold-rush to patent your genes*. Wiley-Blackwell.
- Kropotkin, P. (1902). *Mutual Aid: A Factor of Evolution*. Forgotten Books.
- Kuhn, T. S. (1996). *The Structure of Scientific Revolutions* (3rd ed.). University Of Chicago Press.
- Latour, B. (1992). Where are the missing masses? The sociology of a few mundane artifacts. In W. E. Bijker & J. Law (Eds.), *Shaping Technology/Building Society: Studies in Sociotechnical Change* (pp. 225-258). Cambridge, MA: MIT Press.
- Latour, B. (1994). On Technical Mediation - Philosophy, Sociology, Genealogy. *Common Knowledge*, 3(2), 29-64.
- Latour, B. (1996). On actor-network theory. A few clarifications. *Soziale Welt*, 47(4), 369-381.
- Latour, B. (1999). On recalling ANT. In J. Law & J. Hassard (Eds.), *Actor Network Theory and after* (pp. 15-25). Wiley-Blackwell.
- Lehrbaum, R. (2003, August 16). The Linux Devices Showcase. *Linux for Devices*. Retrieved August 31, 2010, from <http://www.linuxfordevices.com/c/a/Linux-For-Devices-Articles/The-Linux-Devices-Showcase/>
- Lemley, M. A., & Shapiro, C. (2007, January 10). Patent Hold-Up and Royalty Stacking. eScholarship Repository. Retrieved from <http://repositories.cdlib.org/iber/cpc/CPC07-065>
- Lessig, L. (2005). *Free Culture: The Nature and Future of Creativity*. Penguin (Non-Classics).
- Lessig, L. (2006). *Code: And Other Laws of Cyberspace, Version 2.0*. Basic Books.
- Levy, S. (2010). *Hackers: Heroes of the Computer Revolution - 25th Anniversary Edition* (1st ed.). O'Reilly Media.
- Lucarini, R., Caiola, P., & Carrieri, V. (Eds.). (2009). *E-gov 2.0: Pave the way for e-Participation*. Rome: EuroSpace S.r.l.
- Lyons, D. (2006, August 3). Linux Licensing. *Forbes.com*. Retrieved from http://www.forbes.com/2006/03/09/torvalds-linux-licensing-cz_dl_0309torvalds1.html

- Macaluso, M. (2007). *Democrazia e consultazione on line*. Milano: FrancoAngeli.
- MacCallum, C. J. (2007). When Is Open Access Not Open Access? *PLoS Biology*, 5(10), 2095-2097. doi:10.1371/journal.pbio.0050285
- Mathes, A. (2004). Folksonomies - cooperative classification and communication through shared metadata. Retrieved from <http://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.135.1000>
- McAndrew, F. T. (2002). New Evolutionary Perspectives on Altruism: Multilevel-Selection and Costly-Signaling Theories. *Current Directions in Psychological Science*, 11(2), 79-82. doi:10.1111/1467-8721.00173
- Ming-Wei Wu, & Ying-Dar Lin. (2001). Open source software development: an overview. *Computer*, 34(6), 33-38. doi:10.1109/2.928619
- Mitcham, C. (2009). Convivial software: an end-user perspective on free and open source software. *Ethics and Information Technology*, 11(4), 299-310. doi:10.1007/s10676-009-9209-7
- Moen, R. (1999, November 14). Fear of Forking, original version (corrected and annotated). Retrieved from http://linuxmafia.com/faq/Licensing_and_Law/forking.html
- Mohamed, A. (2007, June 5). The rise of the computing appliance. *Computer Weekly*. Retrieved August 31, 2010, from <http://www.computerweekly.com/Articles/2007/06/05/224539/the-rise-of-the-computing-appliance.htm>
- Monti, M. (2001). *European Competition Day, 11 June 2001, speech at Scandic Hotel Slussen, Stockholm*. European Commissioner for Competition Policy Content, Competition and Consumers: Innovation and Choice. Retrieved from <http://europa.eu/rapid/pressReleasesAction.do?reference=SPEECH/01/275>
- O'Flynn, I. (2006). *Deliberative democracy and divided societies*. Edinburgh University Press.
- PNT. (2010, May 7). Information about the End of GPS Selective Availability. *The National Executive Committee for Space-Based Positioning, Navigation, and Timing*. Retrieved June 4, 2010, from <http://pnt.gov/public/sa/>
- Popper, K. R. (2002). *The logic of scientific discovery*. Routledge.
- Raymond, E. (1999). The cathedral and the bazaar. *Knowledge, Technology & Policy*, 12(3), 23-49. doi:10.1007/s12130-999-1026-0
- Rip, A. (2002). *Co-Evolution of Science, Technology and Society* (An Expert Review for the Bundesministerium Bildung und Forschung's Förderinitiative Politik, Wissenschaft und Gesellschaft (Science Policy Studies), as managed by the Berlin-Brandenburgische Akademie der Wissenschaften). University of Twente. Retrieved from <http://www.sciencepolicystudies.de/dok/expertise-rip.pdf>
- Rip, A., & Kemp, R. (1998). Technological change. In S. Rayner & E. L. Malone (Eds.), *Human choice and climate change* (Vol. 2, pp. 327-399). Battelle Press.
- Rip, A., & Schot, J. W. (2002). Identifying Loci for Influencing the Dynamics of Technological Development. In K. H. Soerensen & R. Williams (Eds.), *Shaping Technology. Guiding Policy; concepts Spaces and Tools* (pp. 158-176). Edward Elgar. Retrieved from <http://purl.utwente.nl/publications/44526>
- RSA Laboratories. (2010). 6.4.3 Why is cryptography export-controlled? *RSA Laboratories*. Retrieved June 4, 2010, from <http://www.rsa.com/rsalabs/node.asp?id=2330>

- Simpson, J., & Weiner, E. (Eds.). (1989). *The Oxford English Dictionary: Blue Leather Edition Twenty-volume Set* (2nd ed.). Oxford University Press, USA.
- Sismondo, S. (2009). *An Introduction to Science and Technology Studies*. John Wiley and Sons.
- Stephen, A. T., & Berger, J. A. (2009). Creating Contagious: How Social Networks and Item Characteristics Combine to Drive Persistent Social Epidemics. *Social Science Research Network Working Paper Series*. Retrieved from <http://ssrn.com/abstract=1354803>
- Stephen, A. T., Dover, Y., & Goldenberg, J. (2010). A Comparison of the Effects of Transmitter Activity and Connectivity on the Diffusion of Information Over Online Social Networks. *INSEAD Working Paper No. 2010/35/MKT*. Retrieved from <http://ssrn.com/abstract=1609611>
- Suber, P. (Ed.). (2003, June 20). Bethesda Statement on Open Access Publishing. Retrieved from <http://www.earlham.edu/~peters/fos/bethesda.htm>
- Sunstein, C. (2008). Neither Hayek nor Habermas. *Public Choice*, 134(1), 87-95. doi:10.1007/s11127-007-9202-9
- Sunstein, C. R. (1995). On the Expressive Function of Law. *University of Pennsylvania Law Review*, 144, 2021.
- Tannert, C., Elvers, H., & Jandrig, B. (2007). The ethics of uncertainty. *EMBO Rep*, 8(10), 892-896. doi:10.1038/sj.embor.7401072
- Taylor, R. (2006, January 6). The great firewall of China. *BBC News*. Retrieved from http://news.bbc.co.uk/2/hi/programmes/click_online/4587622.stm
- The Sun. (2010, July 14). Chicken-and-Egg Mystery Finally Cracked. *Fox News*. Text.Article, . Retrieved August 31, 2010, from <http://www.foxnews.com/scitech/2010/07/14/chicken-egg-mystery-finally-cracked/>
- Trivers, R. L. (1971). The Evolution of Reciprocal Altruism. *The Quarterly Review of Biology*, 46(1), 35-57.
- Turner, B. S. (1997). Citizenship studies: A general theory. *Citizenship Studies*, 1(1), 5-18. doi:10.1080/13621029708420644
- Turner, B. S. (2002). Cosmopolitan Virtue, Globalization and Patriotism. *Theory, Culture & Society*, 19(1-2), 45-63. doi:10.1177/026327640201900102
- Urbinati, N., & Warren, M. E. (2008). The Concept of Representation in Contemporary Democratic Theory. *Annual Review of Political Science*, 11(1), 387-412. doi:10.1146/annurev.polisci.11.053006.190533
- Vander Wal, T. (2007, February 2). Folksonomy. *vanderwal.net*. Retrieved July 22, 2010, from <http://vanderwal.net/folksonomy.html>
- Verbeek, P. (2005). *What Things Do: Philosophical Reflections on Technology, Agency, And Design*. Pennsylvania State University Press.
- Verbeek, P. (2008a). Obstetric Ultrasound and the Technological Mediation of Morality: A Postphenomenological Analysis. *Human Studies*, 31(1), 11-26. doi:10.1007/s10746-007-9079-0
- Verbeek, P. (2008b, September 1). *Moralizing Technology: Understanding and Designing the Morality of Things*. Forthcoming, University of Twente.
- Verbeek, P. (2009, October 15). *The limits of humanity: on technology, ethics, and human nature*. Lecture presented on the occasion of the appointment as professor of Philosophy

- of Man and Technology, Faculty of Behavioural Sciences University of Twente.
- Walker, J. (2005). Mirrors and shadows: The digital Aestheticisation of Oneself. *Proceedings, Digital Arts and Culture 2005, IT University, Copenhagen*. Retrieved from <https://bora.uib.no/bitstream/1956/1136/1/mirrorsandshadows-final.pdf>
 - Wallach, D. S. (2001). Copy Protection Technology is Doomed. *Computer*, 34(10), 48–49. doi:10.1109/2.955098
 - Wheeler, D. A. (2007, April 16). Why Open Source Software / Free Software (OSS/FS, FOSS, or FLOSS)? Look at the Numbers! *David A. Wheeler's Personal Home Page*. Retrieved August 31, 2010, from http://www.dwheeler.com/oss_fs_why.html#forking
 - Wheeler, D. A. (2010, June 5). Make Your Open Source Software GPL-Compatible. Or Else. Retrieved August 31, 2010, from <http://www.dwheeler.com/essays/gpl-compatible.html#xfree86>
 - Wikipedia contributors. (2010a). Viral phenomenon. In *Wikipedia, The Free Encyclopedia*. Wikimedia Foundation. Retrieved from http://en.wikipedia.org/w/index.php?title=Viral_phenomenon&oldid=360767445
 - Wikipedia contributors. (2010b). Fork_(software_development). In *Wikipedia, The Free Encyclopedia*. Wikimedia Foundation. Retrieved from [http://en.wikipedia.org/w/index.php?title=Fork_\(software_development\)&oldid=381997746](http://en.wikipedia.org/w/index.php?title=Fork_(software_development)&oldid=381997746)
 - Wiki: What Is Wiki. (n.d.). Retrieved October 1, 2008, from <http://www.wiki.org/wiki.cgi?WhatIsWiki>
 - Winner, L. (1986). *Whale and the Reactor: A Search for Limits in an Age of High Technology*. University of Chicago Press.
 - Wolf, M., Miller, K., & Grodzinsky, F. (2009). On the meaning of free software. *Ethics and Information Technology*, 11(4), 279-286. doi:10.1007/s10676-009-9207-9
 - Woolgar, S., & Cooper, G. (1999). Do Artefacts Have Ambivalence? Moses' Bridges, Winner's Bridges and Other Urban Legends in S&TS. *Social Studies of Science*, 29(3), 433-449.
 - Zalzman, D. (2007, August 7). Stock Waves: Citizen Photo Journalists Are Changing the Rules. *Wired.com*. Retrieved August 3, 2010, from <http://www.wired.com/techbiz/media/news/2007/07/stockwaves>
 - Zeitlyn, D. (2003). Gift economies in the development of open source software: anthropological reflections. *Research Policy*, 32(7), 1287-1291. doi:10.1016/S0048-7333(03)00053-2
 - Zuckerman, E. (2010, July). *Listening to global voices*. Presented at the TEDGlobal 2010, Oxford. Retrieved from http://www.ted.com/talks/ethan_zuckerman.html